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ABSTRACT

Nine units on anatomy and physiology are presented in this teacher's guide. The units are the following: organization and general plan of the body; skeletal and muscular systems; digestive system; circulatory system; respiratory system; nervous system and special senses; urinary system; reproductive system; and endocrine glands. Each instructional unit generally contains eight components: performance objectives; an outline of minimum instructor and student activities to accomplish unit objectives; information sheets presenting basic unit content; transparency masters; job sheets which outline skills to be achieved; student assignment sheets related to the unit information sheets (answer sheets are provided); and objective tests with answer sheets. (CT)

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ED170603

ANATOMY and PHYSIOLOGY

HEALTH OCCUPATIONS EDUCATION

TEACHER'S GUIDE

PUBLISHED BY

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U.S. DEPARTMENT OF HEALTH,
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USE OF THE INSTRUCTIONAL UNITS

The H.O.E. instructional units cover certain instructional areas of the classroom program. Each instructional unit includes most or all of the basic components of a unit of instruction; performance objectives, suggested activities, information sheets, assignment sheets, job sheets, transparency masters, unit tests, and answers to the unit tests. Units are planned for more than one classroom period of instruction.

Careful study of each instructional unit will enable the teacher to determine:

A. The amount of material that can be covered in each class period

B. The skills that must be demonstrated

C. The supplies and equipment needed for skill performance

D. The amount of classroom time needed for teacher demonstration and student practice

E. Supplementary materials that may be ordered

F. Any resource personnel who must be contacted

The specific components of an instructional unit perform the following functions.

OBJECTIVES

Each unit of instruction is based on performance objectives. These objectives specify the exact behaviors the student will be exhibiting, thus providing students with a sense of direction.

Performance objectives are stated in two forms. The unit objectives state the materials to be covered in the unit of instruction and how the student will handle the material. Specific objectives state the types of performance the student will be doing to satisfy the unit objective.

A classroom discussion should follow immediately after the students read the objectives so that any questions concerning the performances expected of the student can be answered.

SUGGESTED ACTIVITIES

Each unit of instruction has a suggested activities sheet outlining steps to follow in accomplishing specific objectives.

Instructor. Duties of the instructor will vary from unit to unit, but the following are minimum activities for the instructor:

1. Provide students with objectives, information, assignment and/or job sheets

2. Discuss objectives and information sheets

3. Make transparencies

4

4. Demonstrate procedures outlined on job sheets (when included)

5. Give test

Any additional instructional activities and teaching methods to aid students in accomplishing the objectives are strongly encouraged.

Student. Student activities are listed to help the student achieve the objectives of the unit.

INFORMATION SHEET

Information sheets provide content essential for meeting the cognitive requirements of the unit. These sheets provide an excellent guide for presenting necessary knowledges necessary to develop the skills specified in the unit objective.

Students should read the information sheets before the information is discussed in class. Students are encouraged to make any additional notes on the information sheets to help them in their learning process.

TRANSPARENCY MASTER

Transparency masters provide information in a special way. Transparencies may present new information or they may reinforce information presented in the information sheets. They are particularly effective when identification is necessary.

Make the transparencies from the masters and place them in your notebook ready for immediate use.

Copies of transparency masters can be made and used as student handouts to supplement the material contained in the information sheet.

JOB SHEET

Job sheets are an integral part of each unit of instruction. The instructor should be able to demonstrate the skills outlined in the job sheets. Procedures specified in the job sheets give direction to the skill being taught and allow both student and teacher to check student progress in performing the skill. Job sheets provide a ready outline to students and furnish to potential employers a picture of the types of skills being taught.

ASSIGNMENT SHEET

Assignment sheets give direction to study and furnish activities which provide application of the knowledges contained in the information sheet. These may be given to the student for completion in class or used for homework assignments. Answer sheets are provided for checking student progress.

UNIT TEST

Unit test questions have been constructed to measure student achievement of each specific objective listed on the objectives sheet. Individual test items may be pulled out and used as a short test to determine student achievement of a particular objective. This kind of testing may be used as a daily quiz and will help the teacher spot difficulties being encountered by students in their efforts to accomplish the terminal objective.

ANSWERS TO UNIT TEST

Test answers are provided for each unit. These may be used by the teacher and/or student for checking student achievement of the objectives.

PERSONALIZING AND LOCALIZING INSTRUCTIONAL UNITS

Carefully review the instructional units before using the unit in the classroom. In reviewing the units, you may find it necessary to localize and personalize the units based upon the needs of your students.

Some of the ways of supplementing units are the use of audio-visuals, attention-getters, field trips, resource personnel, games and simulations, case studies, peer teaching, role-playing and personal experiences of both the teacher and students.

Various methods may be used in localizing a unit of instruction. You may wish to apply units of instruction to the local community, add additional materials from newspapers and magazines, invite local resource people and arrange for field trips.

In personalizing a unit of instruction, you may want to make the course content relevant to home and/or work situations. You may wish to involve students in the planning of the unit by using their own personal experiences. Having students involved in the teaching of some of the materials is sometimes an effective example of peer teaching.

Remember that as an instructor, you may wish to add any objectives to the units of instruction based on the individual needs of the student. If this procedure is followed, you must add the corresponding information in the information sheet, add any assignment or job sheets as deemed necessary and construct a corresponding unit test item.

TABLE OF CONTENTS

ANATOMY AND PHYSIOLOGY

Unit I	Organization and General Plan of the Body
Unit II	Skeletal and Muscular Systems
Unit III	The Digestive System
Unit IV	The Circulatory System
Unit V	The Respiratory System
Unit VI	The Nervous System and Special Senses
Unit VII	The Urinary System
Unit VIII	The Reproductive System
Unit IX	Endocrine Glands

UNIT I

ORGANIZATION AND GENERAL PLAN OF THE BODY

UNIT OBJECTIVE

After completion of this unit, the student will be able to identify terms, recognize organizational units of the body and locate body cavities. The student will also be able to identify body parts and cell parts on diagrams. This knowledge will be evidenced through application and by satisfactory completion of a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Identify terms relating to body structure and organization.
2. Recognize organizational units of the body.
3. List and locate body cavities, and name the major organs found in each cavity.
4. Identify the indicated parts on the diagram of a typical cell.
5. Identify the indicated parts on the diagram of the human body, lateral view.
6. Identify the indicated parts on the diagram of the human body, posterior view.
7. Identify the indicated parts on the diagram of cavities of the human body, side view.

UNIT I

ORGANIZATION AND GENERAL PLAN OF THE BODY

SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide objective sheet.

  B. Discuss objective sheet.

  C. Pass out information sheet.

  D. Discuss information sheet.

  E. Make and show transparencies.

  F. Distribute and discuss assignment sheets.

  G. Demonstrate procedures outlined in assignment sheets.

  H. Give test and evaluate results.

II. Student:

  A. Read and discuss objective sheet.

  B. Read and discuss material contained in information sheet.

  C. View transparencies and take notes.

  D. Complete assignment sheets.

  E. Perform procedures outlined in assignment sheets.

  F. Take test.

INSTRUCTIONAL MATERIALS

I. To be included in this unit:

  A. Objectives

  B. Information sheets

  C. Transparency masters

    1. I-TM-1--Typical Cell

2. I-TM-2--Lateral View of Human Body

3. I-TM-3--Posterior View of Human Body

4. I-TM-4--Location of Body Cavities, Side View

D. Assignment sheets

1. Assignment Sheet #1--Diagram of Typical Cell

2. Assignment Sheet #2--Diagram of Lateral View of Body

3. Assignment Sheet #3--Diagram of Posterior View of Body

4. Assignment Sheet #4--Diagram of Body Cavities, Side View

E. Answers to assignment sheets

F. Test

G. Answers to test

II. References:

A. Books:

1. Alyn, I. B. and C. P. Anthony. Structure and Function of the Body. 5th ed. St. Louis, Missouri: C. V. Mosby Co., 1976.

2. Anthony, C. P. Basic Concepts in Anatomy and Physiology. 3rd ed. St. Louis, Missouri: C. V. Mosby Co., 1974.

3. Anthony, C. P. and N. J. Kolthoff. Textbook of Anatomy and Physiology. 9th ed. St. Louis, Missouri: C. V. Mosby Co., 1975.

4. Francis, C. C. Introduction to Human Anatomy. 6th ed. St. Louis, Missouri: C. V. Mosby Co., 1975.

5. Memmler, Ruth Lundeen and Dena Lin Wood. The Human Body in Health and Disease. 4th ed. Philadelphia, Pennsylvania: J. B. Lippincott Co., 1977.

UNIT I

ORGANIZATION AND GENERAL PLAN OF THE BODY

INFORMATION SHEET

I. Terms and definitions:

A. Superior -- toward the head, upper, above

B. Inferior -- toward the feet, lower, below

C. Anterior -- front, in front of

D. Posterior -- back, in back of

E. Medial -- toward midline of a structure

F. Lateral -- away from midline, toward side of

G. Proximal -- toward or near trunk, near point of origin

H. Distal -- away from point of origin

I. Sagittal Plane -- divides structure into right and left sections

J. Frontal Plane -- divides structure into posterior and anterior sections

K. Transverse Plane -- divide structure into upper and lower sections

L. Cells -- the smallest structural unit of the body

M. Tissues -- organization of similar cells

N. Organs -- organization of different kinds of tissues

O. Systems -- organization of different kinds of organs

II. Organization of the body into structural units:

A. Cells

1. Structural organization

a. Size -- microscopic, but varies with type of cell

- b. Shape
- c. Parts
  - 1) Plasma membrane
  - 2) Cytoplasm
  - 3) Organelles
    - a) Mitochondria
    - b) Lysosomes
    - c) Ribosomes
    - d) Endoplasmic reticulum
    - e) Golgi apparatus
  - 4) Nucleus
    - a) Contains chromosomes composed of DNA
    - b) Controls reproduction of cell

2. Basic cell functions
   - a. Reproduction
   - b. Oxygen intake
   - c. Metabolism
     - 1) Catabolism--release of energy from food
     - 2) Anabolism--use of food by cell
   - d. Growth
   - e. Response to stimulation
   - f. Movement

B. Tissues--structural organization of similar cells

1. Epithelial tissue
   - a. Functions--protection, absorption, and secretion

        b. Types -- stratified and simple squamous

    2. Connective tissue

        a. Functions -- connection, support, and blood cell formation

        b. Types -- areolar, fibrous, adipose, cartilage, bone, blood, and hemopoietic

    3. Muscle tissue

        a. Function -- contraction

        b. Types -- skeletal, smooth, and cardiac

    4. Nervous tissue

        a. Functions -- transmit information, nervous impulses, and control the whole body

        b. Types --

            1) Astrocytes -- star shaped cells

            2) Microglia -- small cells that move about in brain tissue

C. Organs -- Organs are formed from various tissues that together perform a function. Examples are bones, muscles, brain, heart, stomach, or lungs.

D. Systems -- Systems consist of a group of organs that work together. Examples are skeletal, muscular, nervous, circulatory, digestive, and respiratory systems. Systems form the body.

III. Body cavities

A. Thoracic cavity

    1. Location -- space above diaphragm, enclosed by rib cage

    2. Major organs -- trachea, esophagus, heart, and lungs

B. Abdominal and pelvic cavity

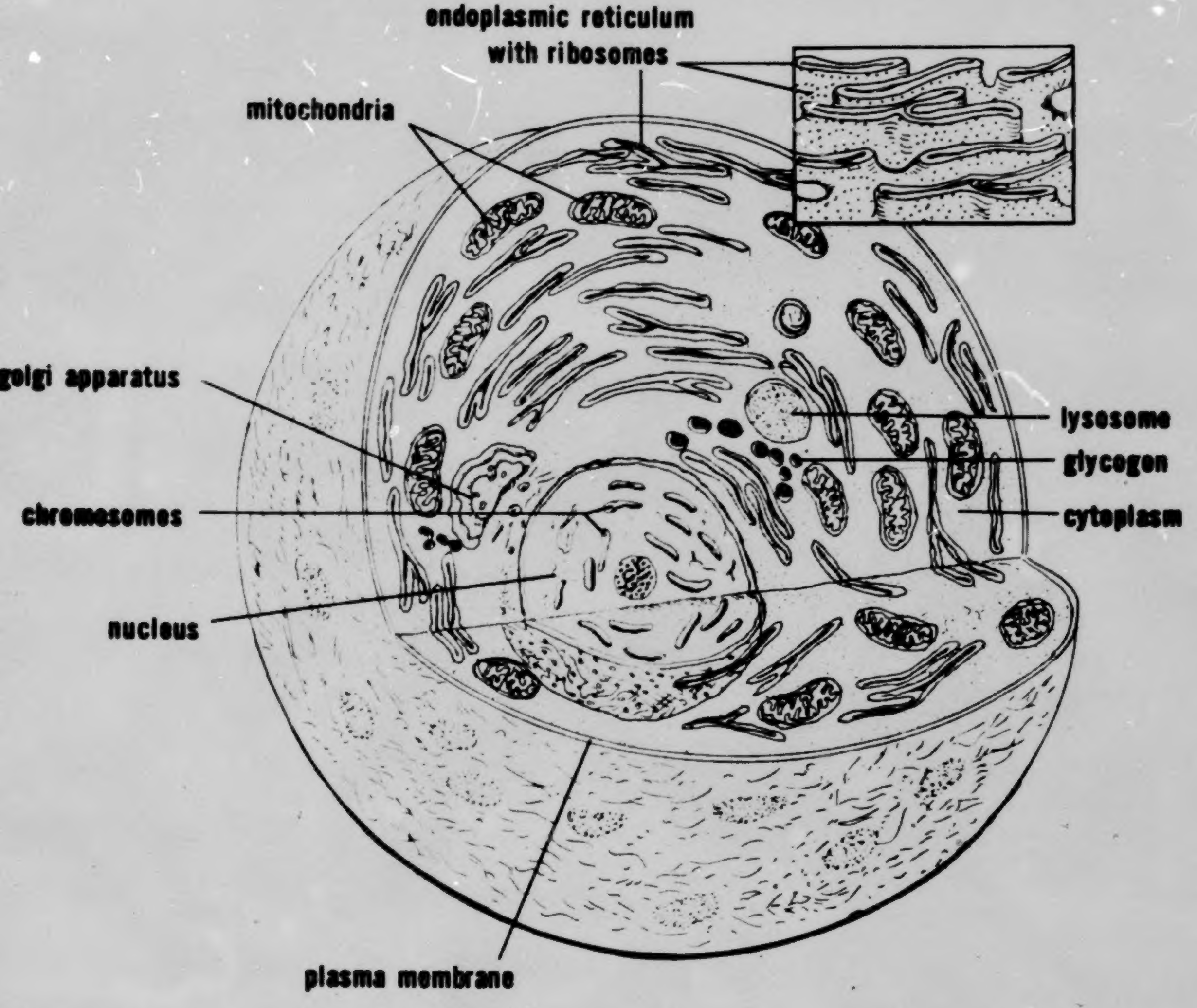
   1. Location -- ventral space below diaphragm

   2. Major organs -- stomach, intestine, kidneys, liver, gall bladder, spleen, urinary bladder, some reprodictive organs

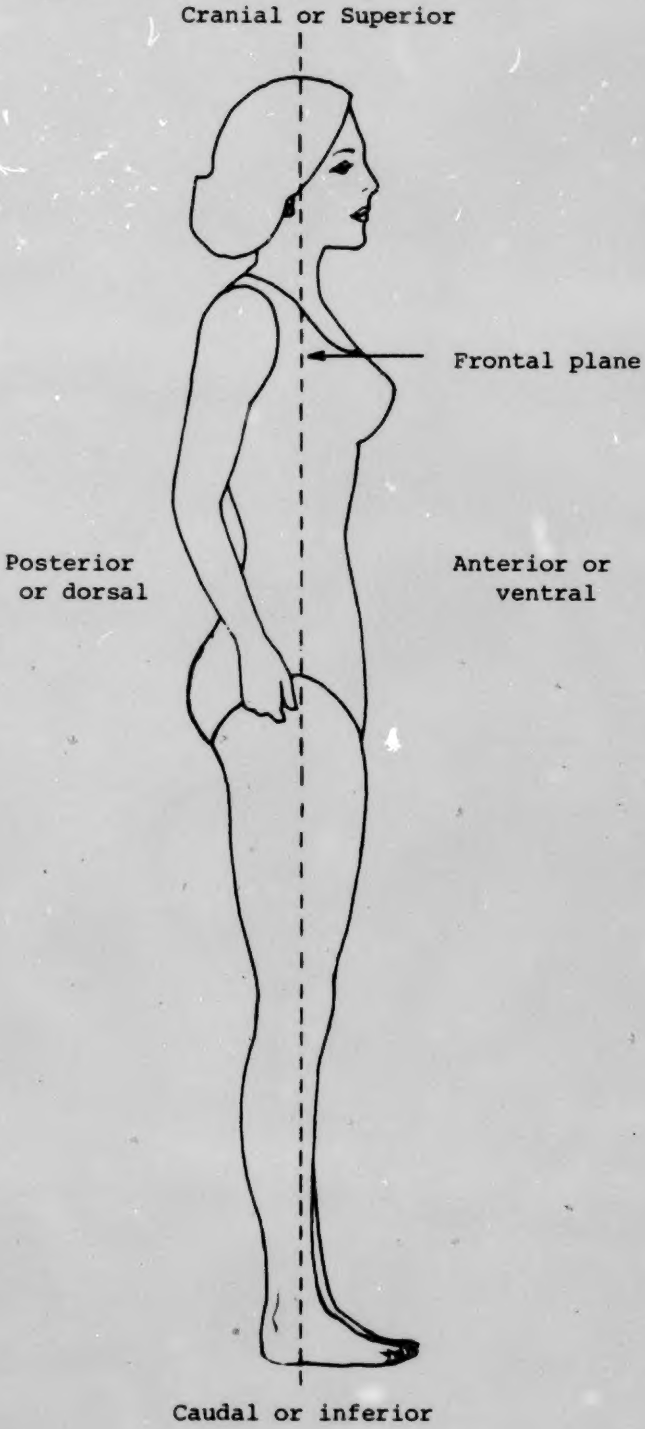
C. Cranial cavity -- located in dorsal part of skull; houses brain

D. Spinal cavity -- located in vertebral column, houses spinal cord

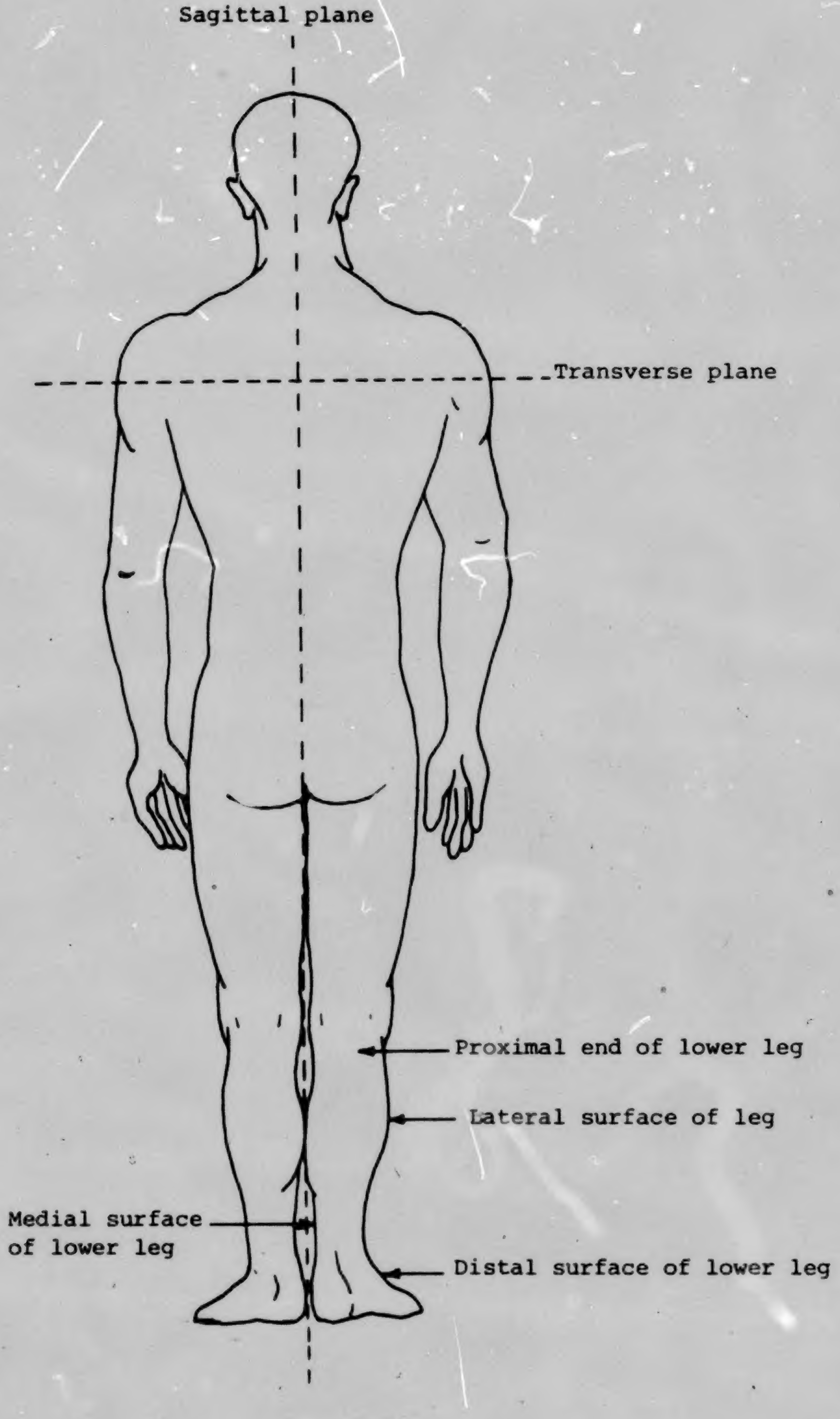
TYPICAL CELL


endoplasmic reticulum with ribosomes
mitochondria
golgi apparatus
chromosomes
nucleus
lysosome
glycogen
cytoplasm
plasma membrane

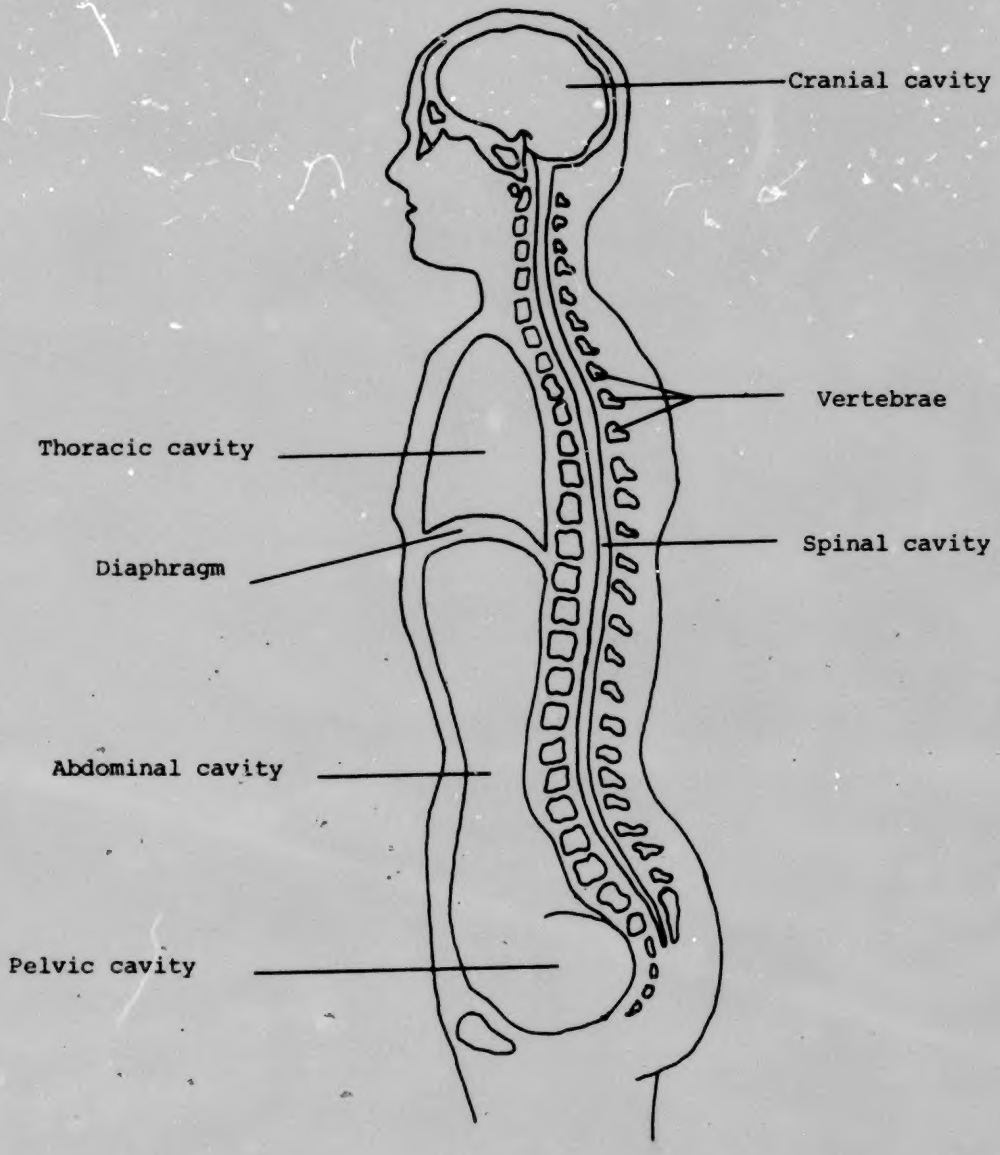
HUMAN BODY, LATERAL VIEW


Cranial or Superior
Frontal plane
Posterior or dorsal
Anterior or ventral
Caudal or inferior

HUMAN BODY, POSTERIOR VIEW


Sagittal plane
Transverse plane
Proximal end of lower leg
Lateral surface of leg
Medial surface of lower leg
Distal surface of lower leg

LOCATION OF BODY CAVITIES, LATERAL VIEW


Cranial cavity
Vertebrae
Thoracic cavity
Spinal cavity
Diaphragm
Abdominal cavity
Pelvic cavity

UNIT I

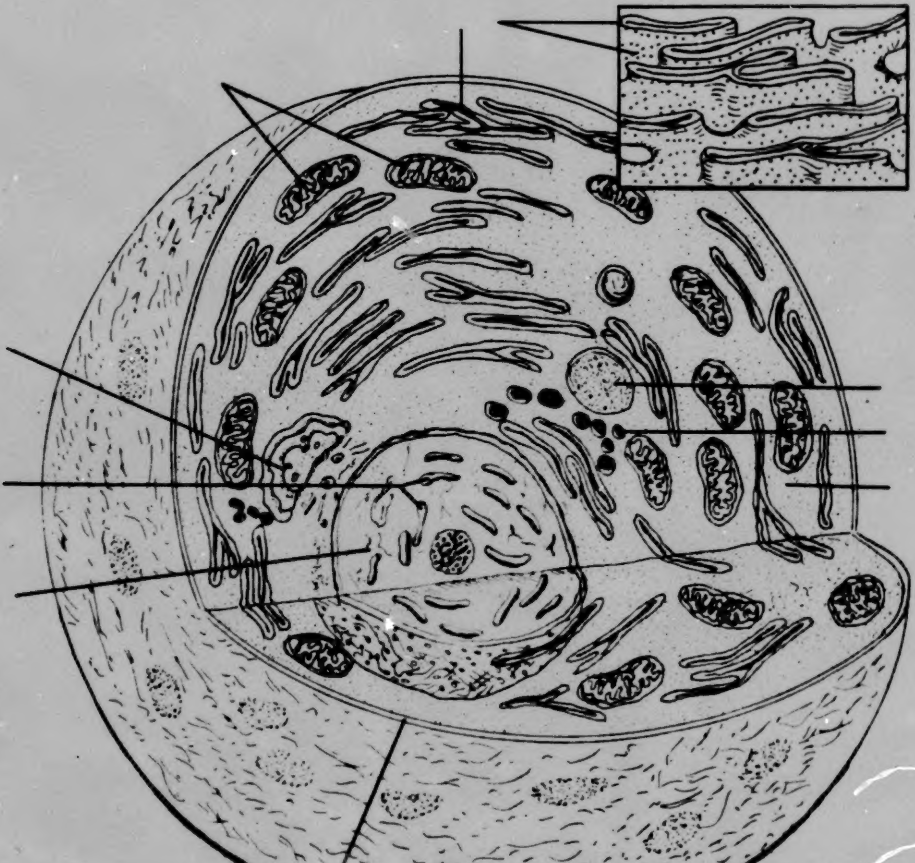
ORGANIZATION AND GENERAL PLAN OF THE BODY

ASSIGNMENT SHEET #1--LABEL DIAGRAM OF TYPICAL CELL

Directions: Label the following indicated parts of a typical cell:

plasma membrane
cytoplasm
mitochondria
lysosomes
ribosomes
endoplasmic reticulum
Golgi apparatus
nucleus

TYPICAL CELL



2

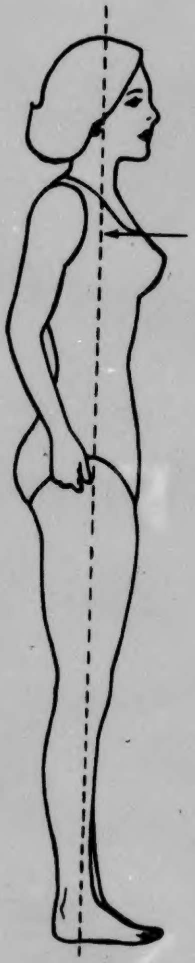
UNIT I

ORGANIZATION AND GENERAL PLAN OF THE BODY

ASSIGNMENT SHEET #2--LABEL DIAGRAM OF LATERAL VIEW OF BODY

Directions: Label the indicated parts of the diagram using the following terms:

cranial or superior
frontal plane
posterior or dorsal
anterior or ventral
caudal or inferior



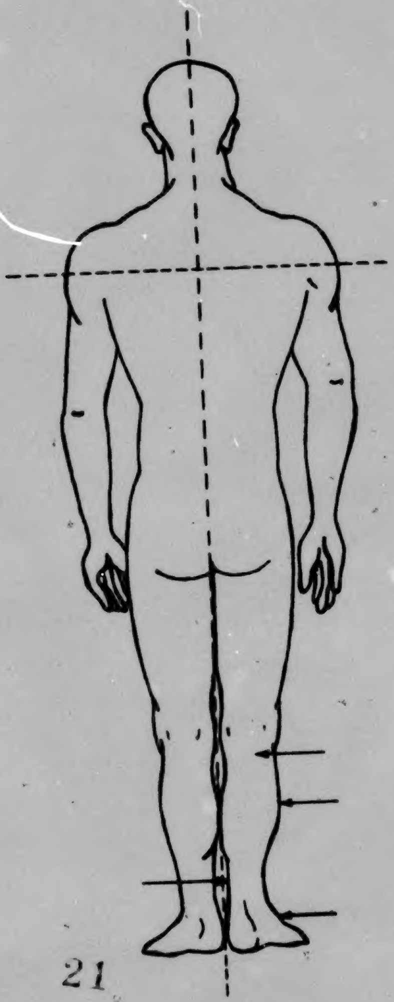
UNIT-I

ORGANIZATION AND GENERAL PLAN OF THE BODY

ASSIGNMENT SHEET #3--LABEL DIAGRAM OF POSTERIOR VIEW OF BODY

Directions: Label the indicated parts of the diagram using the following terms:

- sagittal plane
- transverse plane
- proximal end of lower leg
- lateral surface of leg
- medial surface of leg
- distal end of lower leg



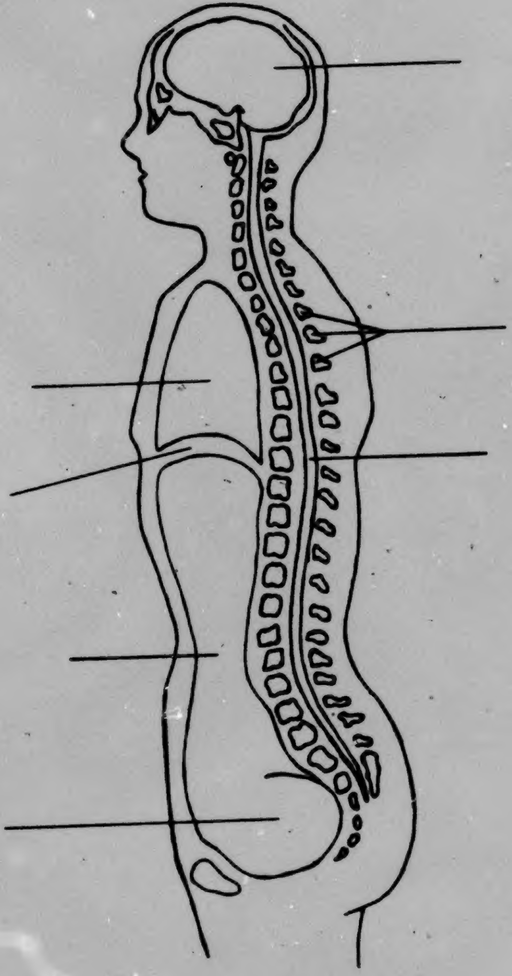
UNIT I

ORGANIZATION AND GENERAL PLAN OF THE BODY

ASSIGNMENT SHEET #4--LABEL DIAGRAM OF BODY CAVITIES, SIDE VIEW

Directions: Label the indicated parts of the diagram using the following terms:

cranial cavity
vertebrae
spinal cavity
thoracic cavity
diaphragm
abdominal cavity
pelvic cavity



UNIT-I

ORGANIZATION AND GENERAL PLAN OF THE BODY

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1--Label Diagram of Typical Cell

See I-TM-1

Assignment Sheet #2--Label Diagram of Lateral View of Body

See I-TM-2

Assignment Sheet #3--Label Diagram of Posterior View of Body

See I-TM-3

Assignment Sheet #4--Label Diagram of Body Cavities, Side View

See I-TM-4

UNIT-I

ORGANIZATION AND GENERAL PLAN OF THE BODY

UNIT TEST

1. Define the following terms:

   a. Superior--

   b. Inferior--

   c. Anterior--

   d. Posterior--

   e. Medial--

   f. Lateral--

   g. Proximal--

   h. Distal--

   i. Sagittal plane--

   j. Frontal plane--

   k. Transverse plane--

   l. Cells--

   m. Tissues--

   n. Organs--

   o. Systems--

2. a. Recognize organizational units of the body

   a. Check those terms in the following list that are cell parts

   _____ 1) nucleus

   _____ 2) shell

   _____ 3) mitochondria

   _____ 4) cytoplasm

   _____ 5) cylinder

_____ 6) endoplasmic reticulum

_____ 7) plasma membrane

_____ 8) reticulocyte

_____ 9) endomorph

_____10) chromosomes

b. List the functions of the cell (at least 5)

1.

2.

3.

4.

5.

c. Complete the following statements using these words:

bone & blood

control of body

contraction

stratified tissue

simple squamous tissue

astrocytes

support

blood cell formation

skeletal muscle tissue

smooth muscle tissue

protection

absorption

1. The function of epithelial tissue is secretion ________________, _____________ and __________________________________.

2. Two types of epithelial tissue are ____________________ and ___________________.

3. The function of connective tissue is connection, ______________________ and ______________________.

4. Types of connective tissue are areolar, fibrous, adipose, cartilage, homopoietic, ________________ and ________________.

5. The function of muscle tissue is ______________________.

6. Two types of muscle tissue are cardiac ________________ and ________________.

7. The function of nervous tissue is to transmit information and nerve impulses and ______________________.

8. Types of cells that form nervous tissue are microglias and ________________.

d. Define organ

e. Define system

f. Complete the following sentences:

1) Cells form ______________________.
2) Tissues form ______________________.
3) Organs form ______________________.
4) Systems form ______________________.

3. List four major cavities of the body:

____

____

____

____

4. Label the following parts on a diagram of a typical cell. (See diagram)

plasma membrane

cytoplasm

mitochondria

lysosomes

ribosomes

endoplasmic reticulum

Golgi apparatus

nucleus

5. Label the following parts on the diagram of the lateral view, human body. (See diagram)

cranial or superior

frontal plane

posterior or dorsal

anterior or ventral

caudal or inferior

6. Label the following parts on the diagram of the posterior view of human body. (See diagram)

sagittal plane

transverse plane

proximal end of lower leg

lateral surface of leg

medial surface of leg

distal end of lower leg

7. Label the following parts on the diagram of the cavities of the human body, side view. (See diagram)

cranial cavity

vertebrae

spinal cavity

thoracic cavity

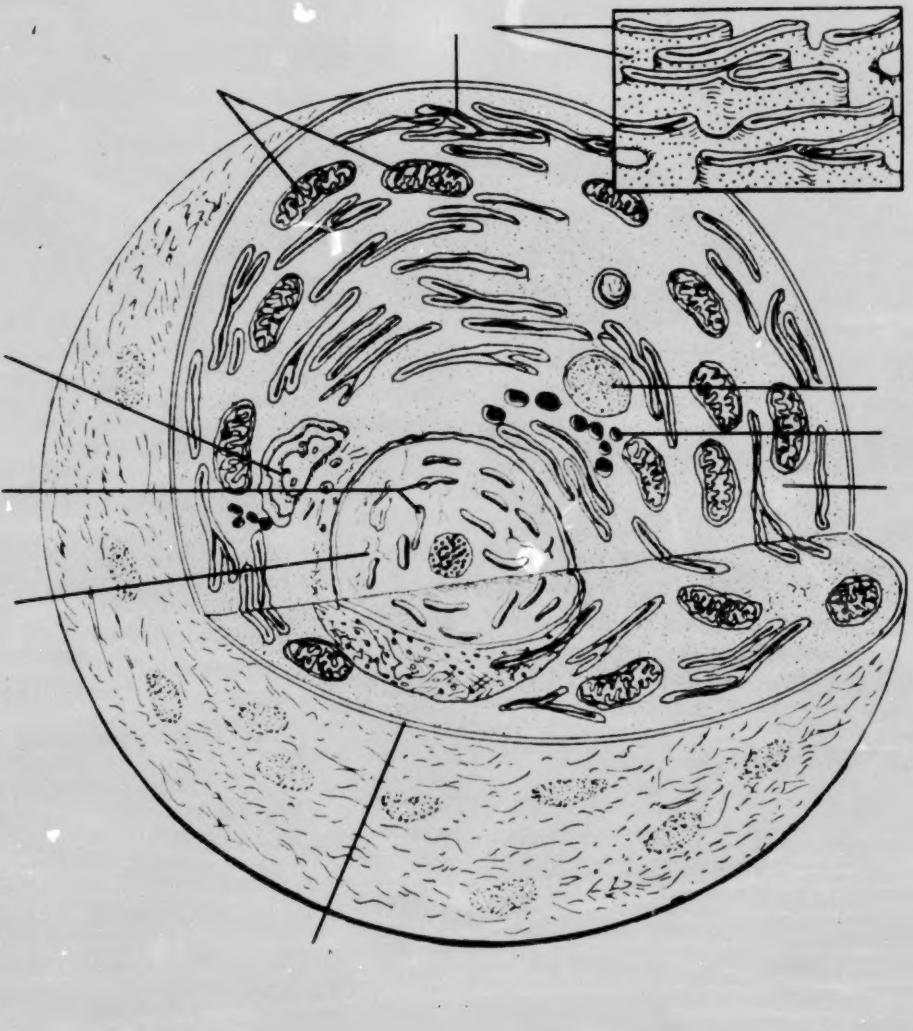
diaphragm

abdominal cavity

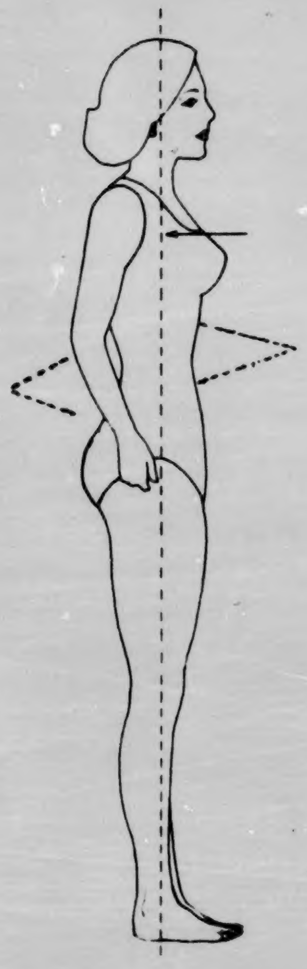
pelvic cavity

(Note: If activities #4-#7 have not been completed prior to the test, ask the instructor when they should be completed.)

TYPICAL CELL



LATERAL VIEW, HUMAN BODY



POSTERIOR VIEW OF HUMAN BODY

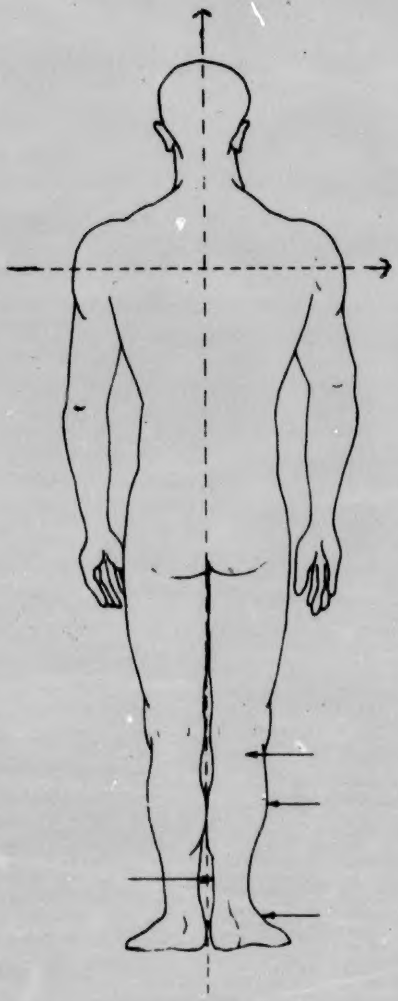
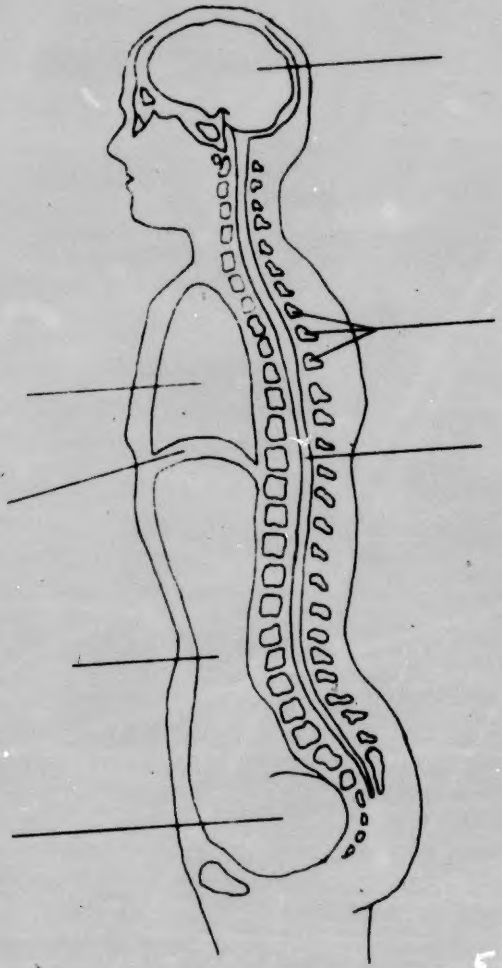


DIAGRAM OF CAVITIES OF HUMAN BODY, SIDE VIEW



UNIT I

ORGANIZATION AND GENERAL PLAN OF THE BODY

ANSWERS TO UNIT TEST

1. a. Toward the head, upper, above
   b. Toward the feet, lower, below
   c. In front of, front
   d. In back of, back, behind
   e. Toward midline of body
   f. Away from midline, toward side of
   g. Toward or near trunk, near point of origin
   h. Away from point of origin
   i. Divides the body into right and left sections
   j. Divides the body into posterior and anterior sections
   k. Divides structure into upper and lower sections
   l. The smallest structural unit of the body
   m. Organization of similar cells
   n. Organization of different kinds of tissues
   o. Organization of different kinds of organs

2. a.

   ✓ 1) Nucleus
   ___ 2) Shell
   ✓ 3) Mitochondria
   ✓ 4) Cytoplasm
   ___ 5) Cylinder
   ✓ 6) Endoplasmic reticulum
   ✓ 7) Plasma membrane

_____ 8) Reticulocyte

_____ 9) Endomorph

✓ 10) Chromosomes

b.

1) Reproduction
2) Oxygen intake
3) Metabolism
    a) anabolism
    b) catabolism
4) Growth
5) Response to stimulation
6) Movement

c.

1) Protection, absorption
2) Stratified, simple squamous
3) Support, blood cell formation
4) Bone, blood
5) Contraction
6) Skeletal, smooth
7) Control the whole body
8) Astrocytes

d. An organ is an organization o[illegible]different kinds of tissue.

e. A system is the largest structural unit of the body; an organization of different kinds of organs.

f.

1) Tissues
2) Organs

    3) Systems

    4) Body

3. a. Thoracic cavity
    b. Cranial cavity
    c. Abdominal-pelvic cavity
    d. Spinal cavity

4. See transparency master I-TM-1

5. See transparency master I-TM-2

6. See transparency master I-TM-3

7. See transparency master I-TM-4

UNIT II

SKELETAL AND MUSCULAR SYSTEMS

UNIT OBJECTIVE

After completion of this unit, the student will be able to define terms relating to the skeletal and muscular systems. The student will be able to identify bones and muscles of the body and will be able to describe disorders.

SPECIFIC OBJECTIVES

After completion of this unit, the student will be able to:

1. Match terms and definitions relating to skeletal and muscular systems.
2. List the functions and divisions of the skeletal system and identify bone injuries and diseases.
3. Write types of muscles and identify muscle disorders.
4. Label bones in diagrams of skeleton.
5. Label muscles in diagram of body.

UNIT II

SKELETAL AND MUSCULAR SYSTEMS

SUGGESTED ACTIVITIES

I. Instructor

  A. Provide objective sheet.

  B. Discuss objective sheet.

  C. Pass out information sheet.

  D. Discuss information sheet.

  E. Make and show transparencies.

  F. Distribute and discuss assignment sheets.

  G. Give test and evaluate results.

II. Student

  A. Read and discuss objective sheet.

  B. Read and discuss material contained in information sheet.

  C. View transparencies.

  D. Complete assignment sheets.

  E. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheet

  C. Transparency masters

    1. II-TM-1--Skeleton, Anterior View

    2. II-TM-2--Skeleton, Posterior View

    3. II-TM-3--Muscles of Body--Posterior View

D. Assignment sheets

1. Assignment Sheet #1--Label Diagram of Skeleton--Anterior View

2. Assignment Sheet #2--Label Diagram of Skeleton-Posterior View

3. Assignment Sheet #3--Questions About the Skeletal and Muscular Systems

4. Assignment Sheet #4--Label Diagrams of Muscles of Body--Posterior View

E. Answers to assignment sheets

F. Unit test

G. Answers to unit test

II. References

A. Books

1. Anderson, Paul D. Clinical Anatomy and Physiology for Allied Health Sciences. Philadelphia, Pennsylvania: W.B. Saunders Co., 1976.

2. Anthony, C.P. Basic Concepts in Anatomy and Physiology. 3rd ed. St. Louis, Missouri: C.V. Mosby Co., 1974.

3. Anthony, C.P. and I.B. Alyn, Structure and Function of the Body. 5th ed. St. Louis, Missouri: C.V. Mosby Co., 1976.

4. Anthony, C.P. and N. J. Kolthoff. Textbook of Anatomy and Physiology. 9th ed. St. Louis, Missouri: C.V. Mosby Co., 1975.

5. Memmler, Ruth Lendeen and Dena Lin Wood. The Human Body in Health and Disease. 4th ed. Philadelphia, Pennsylvania: J.B. Lippincott Co., 1977.

UNIT II

SKELETAL AND MUSCULAR SYSTEMS

INFORMATION SHEET

I. Terms and definitions:

   A. Abduction--motion away from midline of the body, as raising arm to a shelf (Fig. 1)

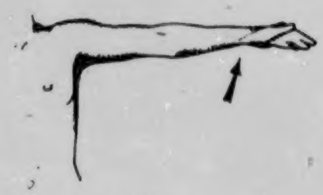


Figure1

Abduction

   B. Adduction--motion toward the midline of the body (Fig. 2)

   C. Joint--point of juncture of two or more bones

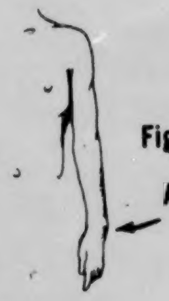


Figure 2

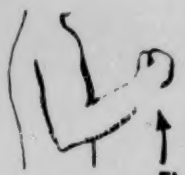
Adduction

   D. Ligament--tissue which connects bones at a joint

   E. Muscle tone--the normal, partially contracted state of muscles

   F. Orthopedics--the medical specialty dealing with bones, joints, and muscles

   G. Osteo--prefix meaning "bone"



Flexion

Figure 3

   H. Posture--body parts held in the positions that favor best function

   I. Rotation--motion around a central axis, as circular motion as of head on neck.

   J. Synovial fluid--lubricating fluid of joints

   K. Tendon--tissue which connects muscles to bone

Extension

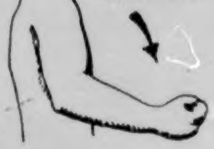


Figure 4

- L. Flexion--decrease in the angle between two bones at their joint (Fig. 3)
- M. Extension--movement that straightens bones at their joint (Fig. 4)

II. Skeletal system

- A. Functions of skeleton
    - 1. Supports and gives shape to body
    - 2. Protects internal organs
    - 3. Makes movement possible
    - 4. Production of blood cells
- B. Divisions of skeleton
    - 1. Axial skeleton
        - a. Skull
            - 1) Cranium
            - 2) Face
        - b. Vertebral column
        - c. Thorax
            - 1) Ribs
            - 2) Sternum
        - d. Ear bones
        - e. Hyoid
    - 2. Appendicular skeleton
        - a. Upper extremities--shoulder girdle, arms, and hands
        - b. Lower extremities--hip girdle, legs, and feet
- C. Bone injuries and diseases
    - 1. Fractures
        - a. Simple fracture--bone is broken but there is no external wound

   b. Compound fracture--bone is broken, skin and soft tissues are torn

   c. Greenstick fracture--incomplete break in which the bone is partially broken and partially bent

2. Dislocations--displacement of bone from its normal position in a joint. The ligaments may be torn and stretched.

3. Bone disorders and disease

   a. Kyphosis--increase in curvature of the spine resulting in a hunchbacked appearance

   b. Lordosis--exaggerated inward curvature in the lumbar region of the spinal column

   c. Osteomyelitis--inflammation of bone

   d. Rickets--bones fail to calcify sufficiently and growth is hampered

   e. Scoliosis--side to side curvature of the spine

   f. Sprain--wrenching of a joint with injury to ligaments

   g. Tuberculosis--bone disease caused by tubercle bacillus

   h. Bursitis--inflammation of the bursa. A bursa is a sac or cavity filled with synovial fluid

   i. Arthritis--inflammation of bones at joints

III. Muscular system

A. Types of muscles

1. Skeletal or voluntary muscles--provide for voluntary body movement. Examples are chewing, movements of head, or walking.

2. Smooth or involuntary muscles--muscles contract independently of the will. Examples are muscles of blood vessels and digestive tract.

3. Cardiac muscle--forms the heart wall and produces heartbeats

B. Muscle disorders

1. Muscular dystrophy--progressive wasting and weakening of muscles

2. Paralysis--muscles do not contract because nerves controlling them are diseased or injured

3. Muscle atrophy--decrease in muscle size due to disuse

4. Hypertrophy--increase in muscle size resulting from increased use

5. Spasm--sudden, violent, and involuntary contraction of a muscle

C. Examples of major muscles and their function

1. Latissimus dorsi--extends upper arm, helps adduct upper arm

2. Deltoid--abducts upper arm

3. Biceps brachii--flexes lower arm

4. Triceps brachii--extends lower arm

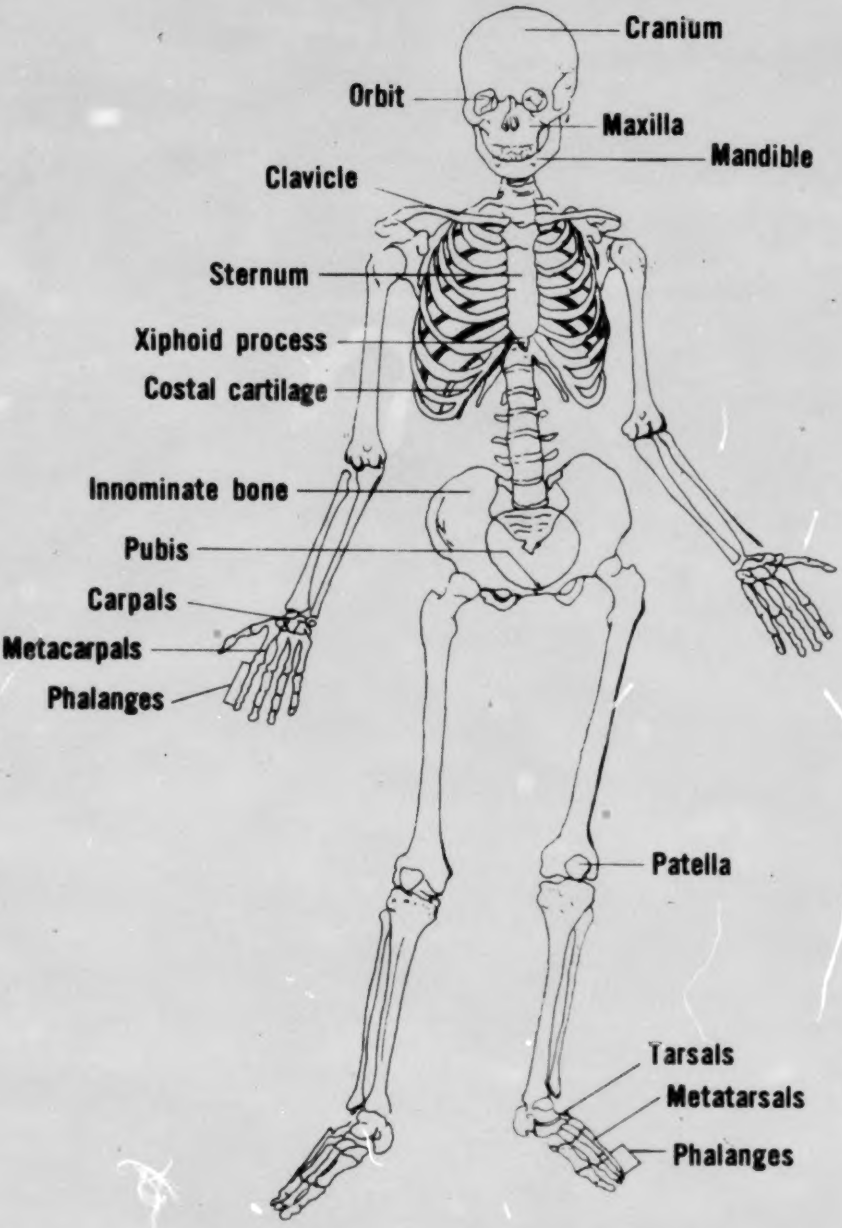
5. Gluteus maximus--extends thigh

6. Trapezius--rotates scapula to left shoulder

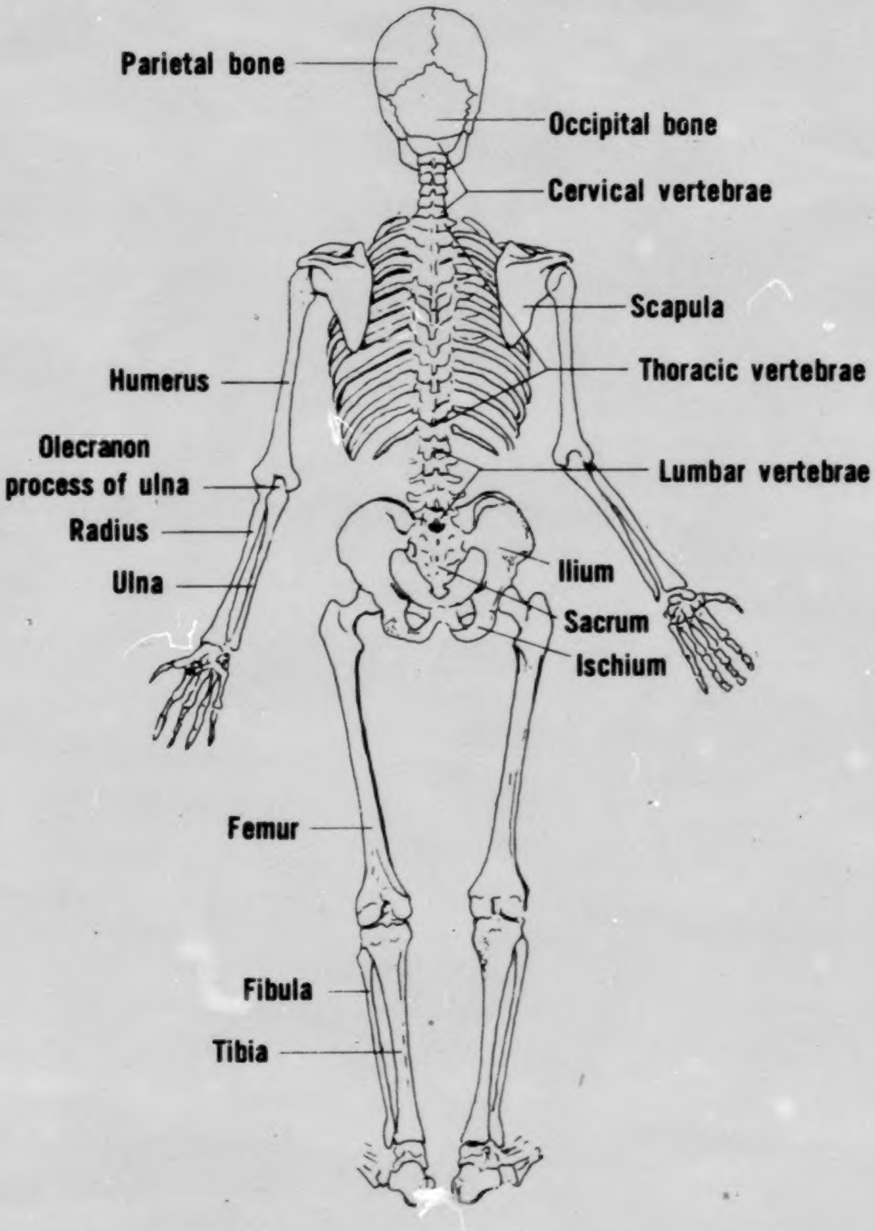
7. Gastrocnemius--flexes leg, adducts and inverts foot

8. *Achilles tendon--*not a muscle but thickest and strongest tendon in body

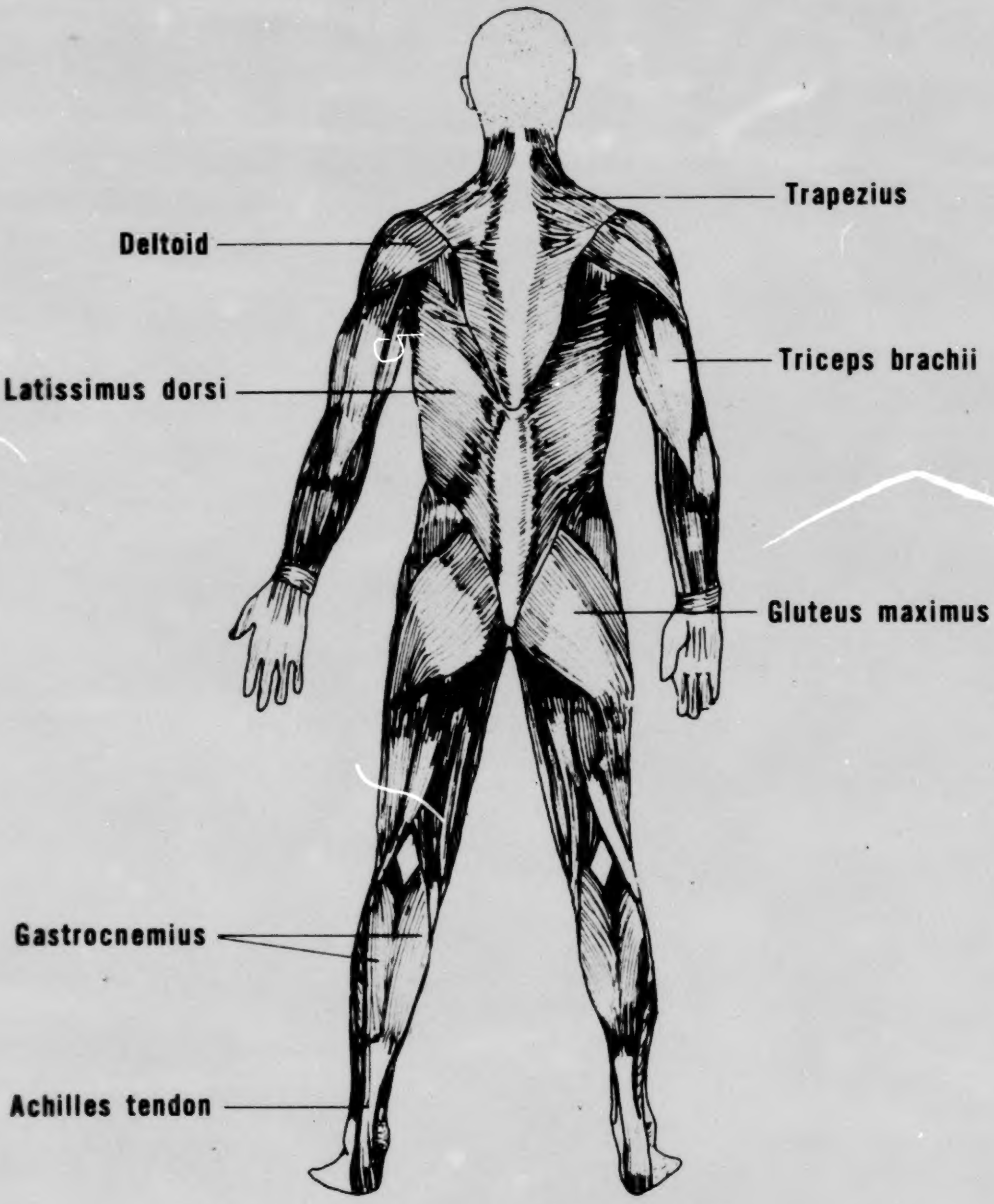
SKELETON, ANTERIOR VIEW


Cranium
Orbit
Maxilla
Mandible
Clavicle
Sternum
Xiphoid process
Costal cartilage
Innominate bone
Pubis
Carpals
Metacarpals
Phalanges
Patella
Tarsals
Metatarsals
Phalanges

SKELETON, POSTERIOR VIEW


Parietal bone
Occipital bone
Cervical vertebrae
Scapula
Humerus
Thoracic vertebrae
Olecranon process of ulna
Lumbar vertebrae
Radius
Ilium
Ulna
Sacrum
Ischium
Femur
Fibula
Tibia

MUSCLES OF THE BODY


Trapezius
Deltoid
Triceps brachii
Latissimus dorsi
Gluteus maximus
Gastrocnemius
Achilles tendon

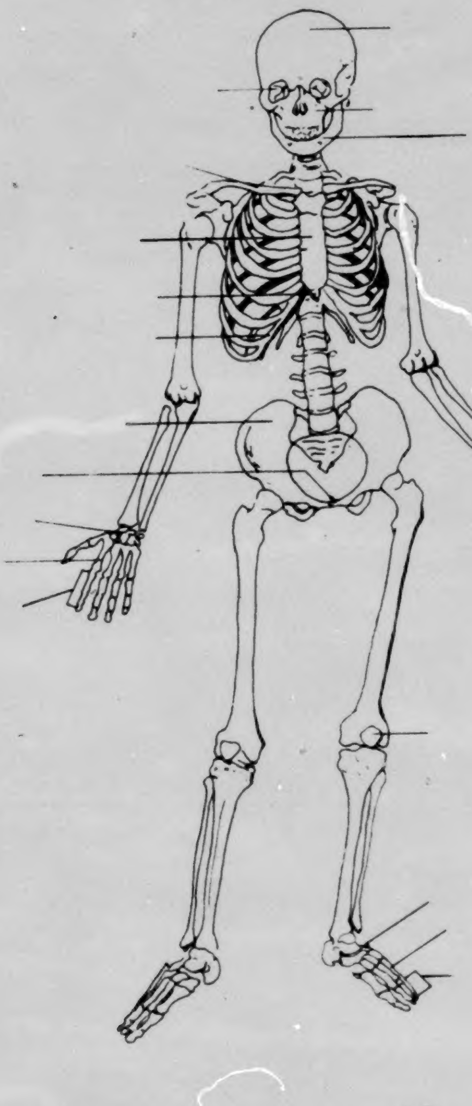
UNIT II

SKELETAL AND MUSCULAR SYSTEMS

ASSIGNMENT SHEET #1--LABEL DIAGRAM OF SKELETON--ANTERIOR VIEW

Using the following terms, label the diagram "Skeleton, Anterior View".

1. cranium
2. orbit
3. maxilla
4. mandible
5. clavicle
6. sternum
7. xiphoid process
8. costal cartilage
9. innominate bone
10. pubis
11. patella
12. carpals
13. metacarpals
14. phalanges
15. tarsals
16. metatarsals
17. phalanges



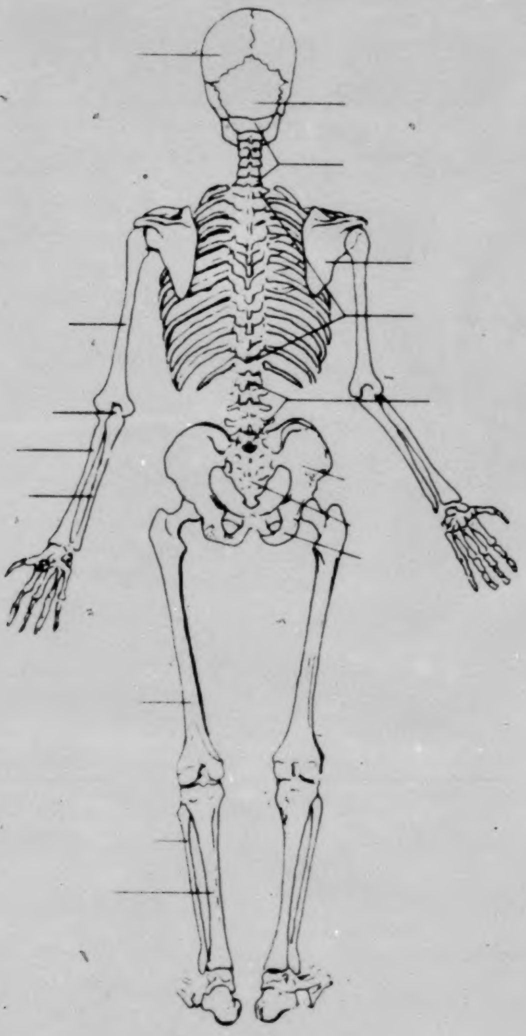
UNIT II

SKELETAL AND MUSCULAR SYSTEMS

ASSIGNMENT SHEET #2--LABEL DIAGRAM OF SKELETON-- POSTERIOR VIEW

Using the following terms, label the diagram "Skeleton, Posterior View".

1. parietal bone
2. occipital bone
3. cervical vertebrae
4. thoracic vertebrae
5. lumbar vertebrae
6. sacrum
7. ilium
8. ischium
9. humerus
10. olecrannon process of ulna
11. radius
12. ulna
13. femur
14. fibula
15. tibia
16. scapula



UNIT II

SKELETAL AND MUSCULAR SYSTEMS

ASSIGNMENT SHEET #3--QUESTIONS ABOUT THE SKELETAL AND MUSCULAR SYSTEMS

Directions: Answer the following questions.

1. List four functions of the skeletal system.

   a.

   b.

   c.

   d.

2. List and describe three types of fractures.

   a.

   b.

   c.

3. List and describe five diseases or disorders of bone.

   a.

   b.

   c.

   d.

   e.

4. List three types of muscles.

   a.

   b.

   c.

5. List and describe five muscle disorders.

   a.

   b.

   c.

   d.

   e.

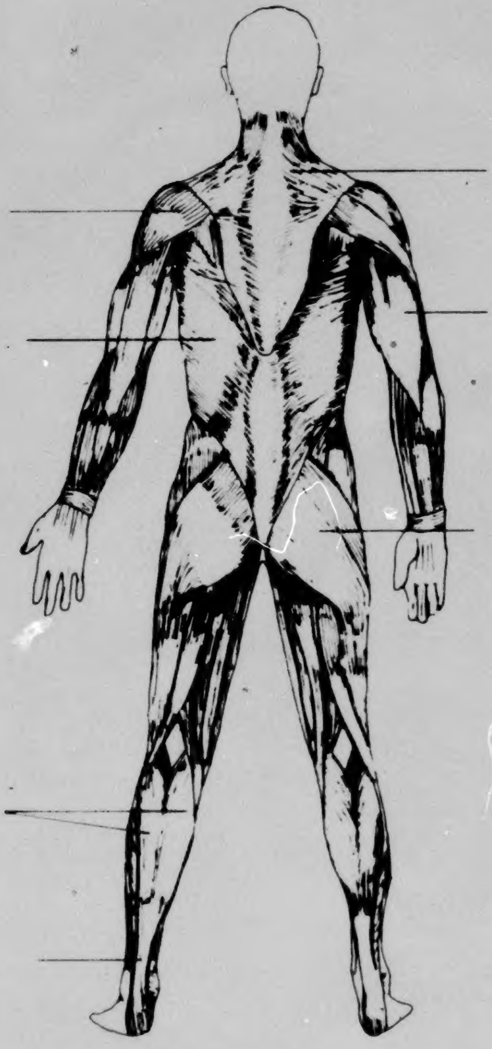
UNIT II

SKELETAL AND MUSCULAR SYSTEMS

ASSIGNMENT SHEET #4--LABEL DIAGRAM OF MUSCLES OF BODY

Directions: Using the following terms, label the diagram "Muscles of the Body".

1. latissiums dorsi
2. deltoid
3. trapezius
4. gastrocnemius
5. triceps brachii
6. Achilles tendon
7. gluteus maximus



UNIT II

SKELETAL AND MUSCULAR SYSTEMS

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1--Label Diagram of Skeleton--Anterior View: See labeled diagram II-TM-1.

Assignment Sheet #2--Label Diagram of Skeleton--Posterior View: See labeled diagram II-TM-2.

Assignment Sheet #3--Questions About the Skeletal and Muscular Systems:

1. A. Supports and gives shape to body

   B. Protects internal organs

   C. Makes movement possible

   D. Production of blood cells

2. A. Simple fracture--bone is broken but there is no external wound

   B. Compound fracture--bone is broken, skin and soft tissues are torn, bone protrudes through skin

   C. Greenstick fracture--incomplete break in which the bone is partially broken and partially bent

3. Answer should include any 5 of the following:

   A. Kyphosis--increase in curvature of the spine resulting in a hunchbacked appearance

   B. Lordosis--exaggerated inward curvature in the lumbar region of the spinal column

   C. Osteomyelitis--inflammation of bone

   D. Rickets--bones fail to calcify sufficiently and growth is hampered

   E. Scoliosis--side to side curvature of the spine

   F. Sprain--wrenching of a joint with injury to ligaments

   G. Tuberculosis--bone disease caused by tubercle bacillus

H. Bursitis--inflammation of the bursa. A bursa is a sac or cavity filled with synovial fluid.

I. Arthritis--inflammation of bones at the joints

4. A. Skeletal (voluntary, striated)

B. Smooth (involuntary)

C. Cardiac

5. A. Muscular dystrophy--progressive wasting and weakness of muscles

B. Paralysis--muscles do not contract because nerves controlling them are diseased or injured

C. Muscle atrophy--decrease in muscle size due to disuse

D. Hypertrophy--increase in muscle size resulting from increased use

E. Spasm--sudden, violent, and involuntary contraction of a muscle

Assignment Sheet #4--Label Diagrams of Muscles of Body: See labeled diagram II-TM-3.

UNIT II

SKELETAL AND MUSCULAR SYSTEMS

UNIT TEST

1. Match the terms on the right with their correct definitions.

_____ a. Prefix meaning "bone"

_____ b. Body parts held in the positions that favor best function

_____ c. Tissue which connects bones at a joint

_____ d. Motion away from midline of the body, as raising arm to a shelf

_____ e. Point of juncture of two or more bones

_____ f. The medical specialty dealing with bones, joints, and muscles

_____ g. Motion toward the midline of the body

_____ h. Motion around a central axis, as circular motion of head on neck

_____ i. Movement that straightens bones at their joints

_____ j. Tissue which connects muscles to bone

_____ k. The normal, partially contracted state of muscles

_____ l. Decrease in the angle between two bones at their joint

_____ m. Lubricating fluid of the joints

1. abduction
2. adduction
3. extension
4. flexion
5. joint
6. ligament
7. muscle tone
8. orthopedics
9. osteo
10. posture
11. rotation
12. synovial fluid
13. tendon

2. a. List 4 functions of the skeleton

    1.

    2.

    3.

    4.

   b. Indicate whether each of the following is a part of the axial or appendicular skeleton

    1. leg ____________________

    2. face ____________________

    3. ribs ____________________

    4. ear bones ____________________

    5. shoulder girdle ____________________

    6. hands ____________________

    7. feet ____________________

    8. vertebrae ____________________

    9. arm ____________________

    10. skull ____________________

   c. Complete the following statements, using one of the terms listed below.

    simple fracture
    compound fracture
    greenstick fracture
    dislocation
    kyphosis
    lordosis
    osteomyelitis
    bursitis
    arthritis
    tuberculosis
    sprain
    scoliosis
    rickets

    1. An exaggerated inward curvature of the spine resulting in a hunchbacked appearance is ____________________.

    2. A fracture in which the bone is broken but there is no external wound is a (an) ____________________.

    3. An inflammation of the bursa is ______________.

4. An inflammation of bones at the joints is ____________________.

5. A displacement of bone from its normal position in a joint is ____________________.

6. An incomplete break in which the bone is partially broken and partially bent is a (an) ____________________.

7. An inflammation of bone is ____________________.

8. The wrenching of a joint with injury to the ligaments is a (an) ____________________.

9. A bone disease caused by the tubercle bacillus is ____________________.

10. A fracture in which the bone is broken, skin and soft tissues are torn, and bone protrudes through the skin is a (an) ____________________.

11. A disease in which the bones fail to calcify sufficiently and growth is hampered is ____________________.

12. The side to side curvature of the spine is ____________________.

13. An exaggerated inward curvature in the lumbar region of the spinal column is ________________.

3. a. List three types of muscles

____

____

____

b. Identify the following muscle disorders.

1. muscular dystrophy--

2. paralysis--

3. muscle atrophy--

4. muscle hypertrophy--

5. muscle spasm--

4. a. Label the following parts of the anterior view of the skeleton.

1. cranium
2. orbit
3. maxilla
4. mandible
5. clavicle
6. sternum
7. xiphoid process
8. costal cartilage
9. innominate bone
10. pubis
11. patella
12. carpals
13. metacarpals
14. phalanges
15. tarsals
16. metatarsals

b. Label the following parts of the posterior view of the skeleton.

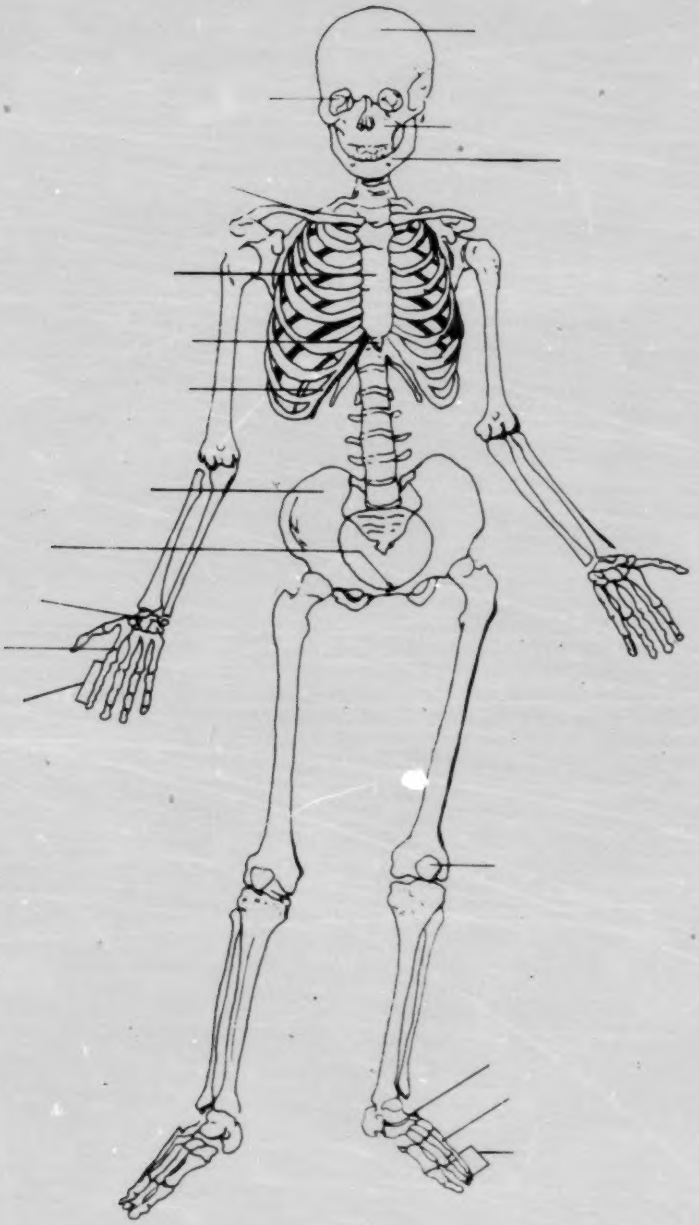
1. parietal bone
2. occipital bone
3. cervical vertebrae
4. thoracic vertebrae
5. lumbar vertebrae
6. sacrum
7. ilium
8. ischium
9. humerus
10. olecranon process of ulna
11. radius
12. ulna
13. femur
14. fibula
15. tibia
16. scapula

5. Label the following parts of the diagram--"Muscles of the Body"

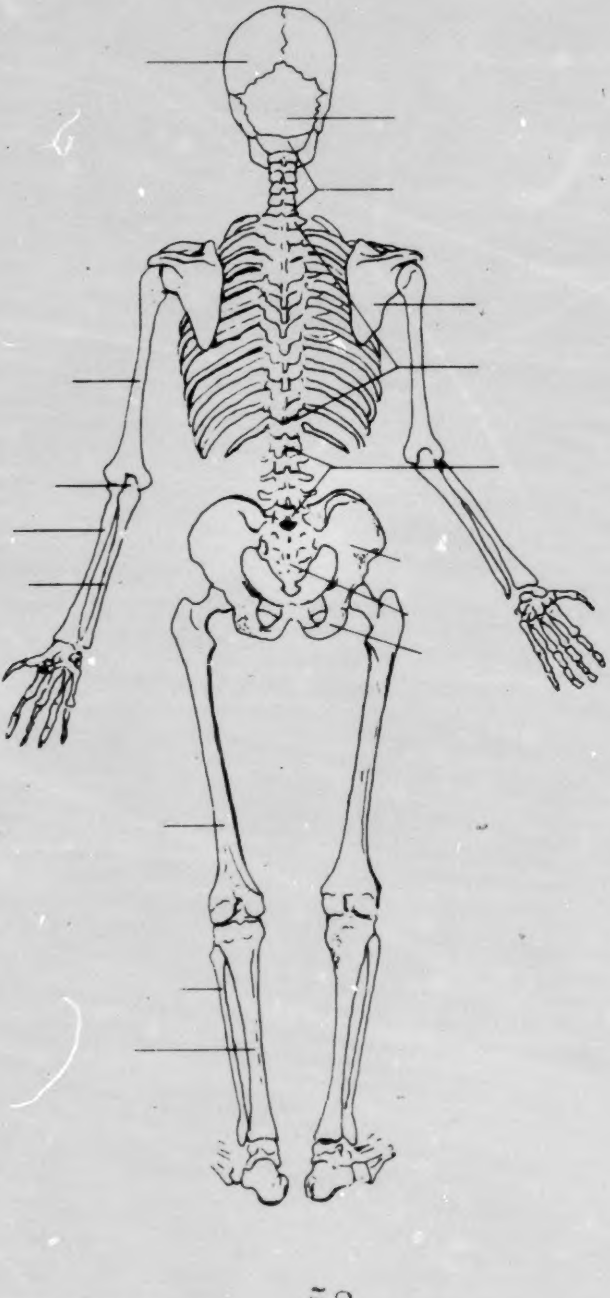
   1. latissimus dorsi
   2. deltoid
   3. triceps brachii
   4. trapezius
   5. gluteus maximus
   6. gastrocnemius
   7. Achilles tendon

   (NOTE: If activities #4 and #5 have not been completed prior to the test, ask the instructor when they should be completed.)

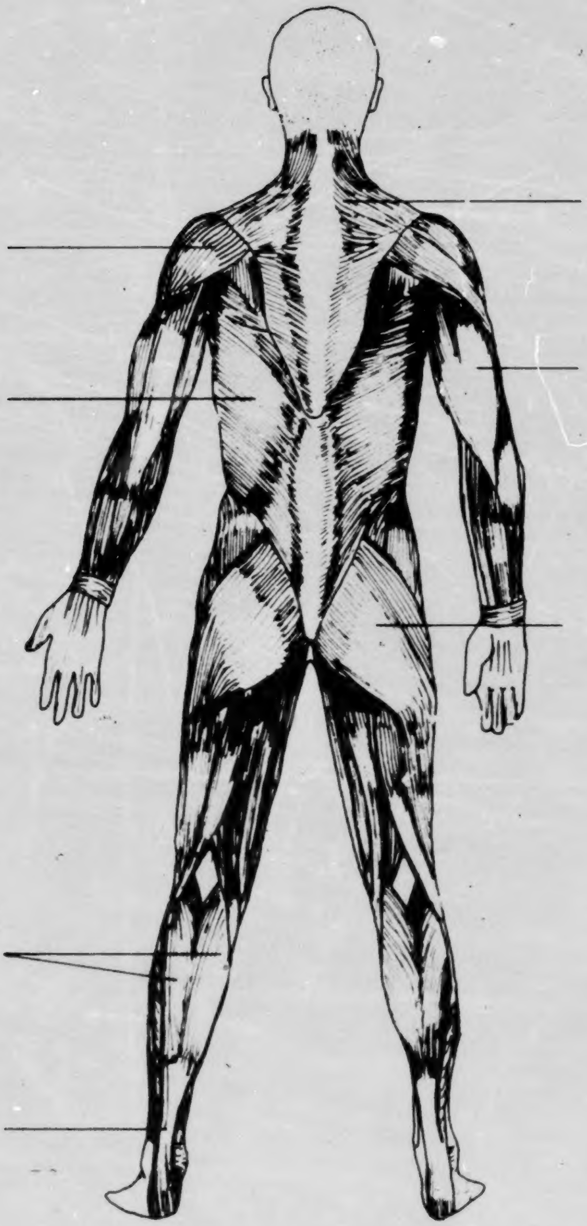
SKELETON, ANTERIOR VIEW



SKELETON, POSTERIOR VIEW



MUSCLES OF THE BODY



UNIT II

SKELETAL AND MUSCULAR SYSTEMS

ANSWERS TO UNIT TEST

1. a. 9
   b. 10
   c. 6
   d. 1
   e. 5
   f. 8
   g. 2
   h. 11
   i. 3
   j. 13
   k. 7
   l. 4
   m. 12

2. a. 1. supports and gives shape to body

   2. protects internal organs

   3. makes movement possible

   4. production of blood cells

   b.

1.	leg	appendicular
2.	face	axial
3.	ribs	axial
4.	ear bones	axial
5.	shoulder girdle	appendicular
6.	hands	appendicular
7.	feet	appendicular
8.	vertebrae	axial
9.	arm	appendicular
10.	skull	axial

   c. 1. kyphosis
   2. simple fracture
   3. bursitis
   4. arthritis
   5. dislocation
   6. green stick
   7. osteomyelitis
   8. sprain
   9. tuberculosis
   10. compound fracture

11. rickets

12. scoliosis

13. lordosis

3. a. skeletal or voluntary
smooth or involuntary
cardiac

   b. 1. muscular dystrophy--progressive wasting and weakness of muscles

      2. paralysis--muscles do not contract because nerves controlling them are diseased or injured

      3. muscle atrophy--decrease in muscle size due to disease

      4. hypertrophy--increase in muscle size resulting from increased use

      5. spasm--sudden, violent, and involuntary contraction of a muscle

4. Evaluated to the satisfaction of the instructor.

5. Evaluated to the satisfaction of the instructor.

UNIT III

THE DIGESTIVE SYSTEM

UNIT OBJECTIVE

After completing this unit, students will be able to define terms relative to digestion, locate parts of the digestive system on a diagram and discuss digestive processes. The students will also be able to identify disorders of the digestive tract. This knowledge will be evidenced through demonstration and by satisfactory completion of a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Match terms and definitions relative to the digestive system
2. Locate the parts of the digestive system and give the function of each part of the digestive system
3. List the digestive juices, their source, and action
4. Identify disorders of the digestive tract
5. Locate the parts of the digestive system on a diagram
6. Identify enzymes
7. Recognize names of digestive disorders

UNIT III

THE DIGESTIVE SYSTEM

SUGGESTED ACTIVITIES

I. Instructor

  A. Provide objective sheet

  B. Discuss objective sheet

  C. Pass out information sheet

  D. Discuss information sheet

  E. Make and show transparencies

  F. Distribute and discuss assignment sheets

  G. Use torso model or chart of digestive system to demonstrate parts of digestive system

  H. Give test and evaluate results

II. Student

  A. Read objective sheet

  B. Discuss objective sheet

  C. Read material contained in information sheet

  D. Discuss information sheet

  E. Complete assignment sheets

  F. Observe or participate in demonstration of parts of digestive sytem using torso model or chart

  G. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit

  A. Objectives

  B. Information sheet

C. Transparency masters

1. III-TM-1--The Digestive System

2. III-TM-2--Digestive Juices and Enzymes

D. Assignment sheets

1. Assignment Sheet #1--Labeling Parts of the Digestive System

2. Assignment Sheet #2--Identifying Enzymes and Their Action

3. Assignment Sheet #3--Word Find Puzzle

E. Answers to assignment sheets

F. Test

G. Answers to test

II. References: Books

A. Anderson, Paul D. Clinical Anatomy and Physiology for Allied Health Sciences. Philadelphia, Pennsylvania: W.B. Saunders, 1976. pp. 366-397.

B. Anthony, Catherine Parker and Irene B. Alyn. Structure and Function of the Body. 5th ed. St. Louis, Missouri: C.V. Mosby Company, 1976. pp. 98-111.

C. Anthony, Catherine Parker and Norma Jane Kolthoff. Textbook of Anatomy and Physiology. 9th ed. St. Louis, Missouri: C.V. Mosby Company, 1975. pp. 384-442.

D. Jacob, Stanley W. and Clarice Ashworth Francone. Structure and Function in Man. 3rd ed. Philadelphia, Pennsylvania: W.B. Saunders Company, 1974. pp. 423-462.

E. Memmler, Ruth Lundeen and Dena Lin Wood. The Human Body in Health and Disease. 4th ed. Philadelphia, Pennsylvania: J.B. Lippincott Company, 1977. pp. 197-213.

UNIT III

THE DIGESTIVE SYSTEM

INFORMATION SHEET

I. Identification of terms

- A. Absorption--the taking up of fluids or other substances by the skin or mucous membrane
- B. Alimentary canal--the continuous tube which extends from the mouth to the anus. The process of digestion takes place in the alimentary canal.
- C. Bile--digestive juice secreted by the liver
- D. Bolus--a rounded mass of chewed food ready to be swallowed
- E. Chyme--the material formed by the mixing and partial digestion of food in the stomach
- F. Defecation--the discharge of fecal material from the rectum
- G. Deglutition--the act of swallowing
- H. Digestion--the changing of insoluble food materials to a soluble form by the action of enzymes
- I. Enzyme--the protein substances produced by the cells that bring about chemical reactions in digestion
- J. Feces--body waste, residue of digestion, discharged from anus
- K. Glycogen--chemical form in which extra carbohydrate is stored in the liver
- L. Heparin--compound produced by the liver which prevents blood clotting
- M. Malnutrition--the lack of needed food in the body or improper absorption and distribution of food by the body
- N. Mastication--chewing

O. Peristalsis--wavelike motion of the muscle tissue of the alimentary canal which moves the food through the digestive tube

P. Rugae--folds, particularly the folds of the mucous membrane lining of the stomach

II. Organs of digestion

A. Mouth

1. Functions

a. receives food

b. prepares food for digestion

c. speech

2. Structures contained in mouth

a. tongue - functions

1) speech

2) guides food

3) contains taste buds which identify sweet, salt, sour, and bitter tastes

b. teeth

1) incisors - cutting

2) canines - tearing and shredding

3) premolars - grinding, crushing

4) molars - grinding, crushing

a) deciduous (baby) teeth (20)

b) permanent teeth (32)

c. three pairs of salivary glands

1) name and location

a) parctid - below and in front of ear

b) submandibular - near body of lower jaw

            - c) sublingual - under tongue
        - 2) functions of saliva
            - a) dissolves food in mouth
            - b) makes it easier to chew food
            - c) contains enzyme, ptyalin, which digests starch

B. Pharynx (throat)

- 1. Tonsils--lymphatic tissue that guards entrance of alimentary and respiratory tracts from bacterial invasion
- 2. Soft palate--forms back of roof of mouth
- 3. Uvula--prevents food and liquid from entering nasal cavity and upper pharynx
- 4. Epiglottis--prevents aspiration of food into trachea

C. Esophagus--connects pharynx and stomach

D. Stomach

- 1. Functions
    - a. receives swallowed food and passes it on to small intestine
    - b. secretes gastric juice
    - c. churns food by contractions of muscles
    - d. carries on limited absorption of water, alcohol, and some drugs
- 2. Structure
    - a. cardiac valve--controls opening of stomach from esophagus
    - b. rugae--fold in lining of stomach which unfold as stomach fills
    - c. pyloric valve--controls opening of stomach into small intestine

E. Small intestine

1. Divisions

a. duodenum--first 10-12 inches of small intestine

b. jejunum--succeeding 8 feet of small intestine

c. ileum--last 12 feet of small intestine

2. Functions

a. completes digestion of food begun in stomach

b. absorbs end products of digestion into blood and lymph

F. Large intestine

1. Divisions

a. cecum--blind sac projecting from large intestine near juncture with small intestine

b. appendix--small blind tube extending from cecum

c. ascending colon

d. transverse colon

e. descending colon

f. sigmoid colon

g. rectum

h. anal canal

i. anus

2. Functions

a. absorption of water

b. elimination of wastes of digestion

G. Accessory organs

1. Liver

a. Location--right hypochondrium and part of epigastrium

b. Functions

1) secretion of bile

2) removal of poisons absorbed from intestine

3) metabolism of carbohydrates, proteins, and fats

4) formation of antibodies

2. Gall bladder

a. Location--undersurface of liver

b. Functions

1) stores and concentrates bile

2) ejects bile into duodenum as needed during digestion

3. Pancreas

a. Location--lies in curve of duodenum

b. Functions--

1) secretes pancreatic juice which contains digestive enzymes

2) manufactures insulin which regulates the amount of glucose used in tissues. This is not a digestive process.

III. Digestive juices

A. Saliva--contains ptyalin which changes starch to double sugar

B. Gastric juice

1. Hydrochloric acid

a. softens connective tissues in meat

b. kills some pathogenic bacteria

c. activates gastric enzymes

2. Enzymes

a. pepsin--begins protein digestion

b. lipase--digests fats

C. Pancreatic juice--contains enzymes

1. Amyolpsin--acts on starches

2. Trypsin--acts on proteins

3. Lipase--acts on fats

D. Intestinal juice--contains enzymes

1. Lactase--changes complex sugar to simple sugar

2. Maltase--changes complex sugar to simple sugar

3. Sucrase--changes complex sugar to simple sugar

E. Bile--breaks down fats

IV. Disorders of digestive system

A. Mouth and teeth

1. Dental caries--tooth decay

2. Gingivitis--infection of gum

3. Mumps--viral infections of the salivary glands

4. Pyorrhea--inflammation of tooth socket

5. Stomatitis--infection of lining of mouth

B. Stomach

1. Flatulence--excessive amount of gas in stomach or intestine

2. Gastritis--inflammation of the lining of the stomach

3. Heartburn--burning sensation in cardiac portion of stomach

4. Nausea--feeling of illness following distention or irritation of stomach as a result of mechanical or nervous factors

5. Pyloric stenosis--abnormal constriction of pyloric valve

6. Stomach cancer--malignant tumor of the lining of the stomach

7. Ulcer--an area of mucous membrane in which the tissues are gradually disintegrating (may be stomach or duodenum)

8. Vomiting--reverse peristalsis causing ejection of stomach contents through the mouth

C. Small and large intestines

1. Appendicitis--inflammation of the appendix

2. Constipation--abnormal delay in, or infrequent bowel movement

3. Diarrhea--abnormally frequent, watery, bowel movement

4. Diverticulitis--inflammation of the diverticuli (distended sacs) of the colon

5. Dysentery--inflammation of mucosal lining of intestines

D. Liver

1. Cirrhosis -chronic disease in which active liver cells are replaced by scar tissue

2. Hepatitis--inflammation of the liver

E. Gall bladder

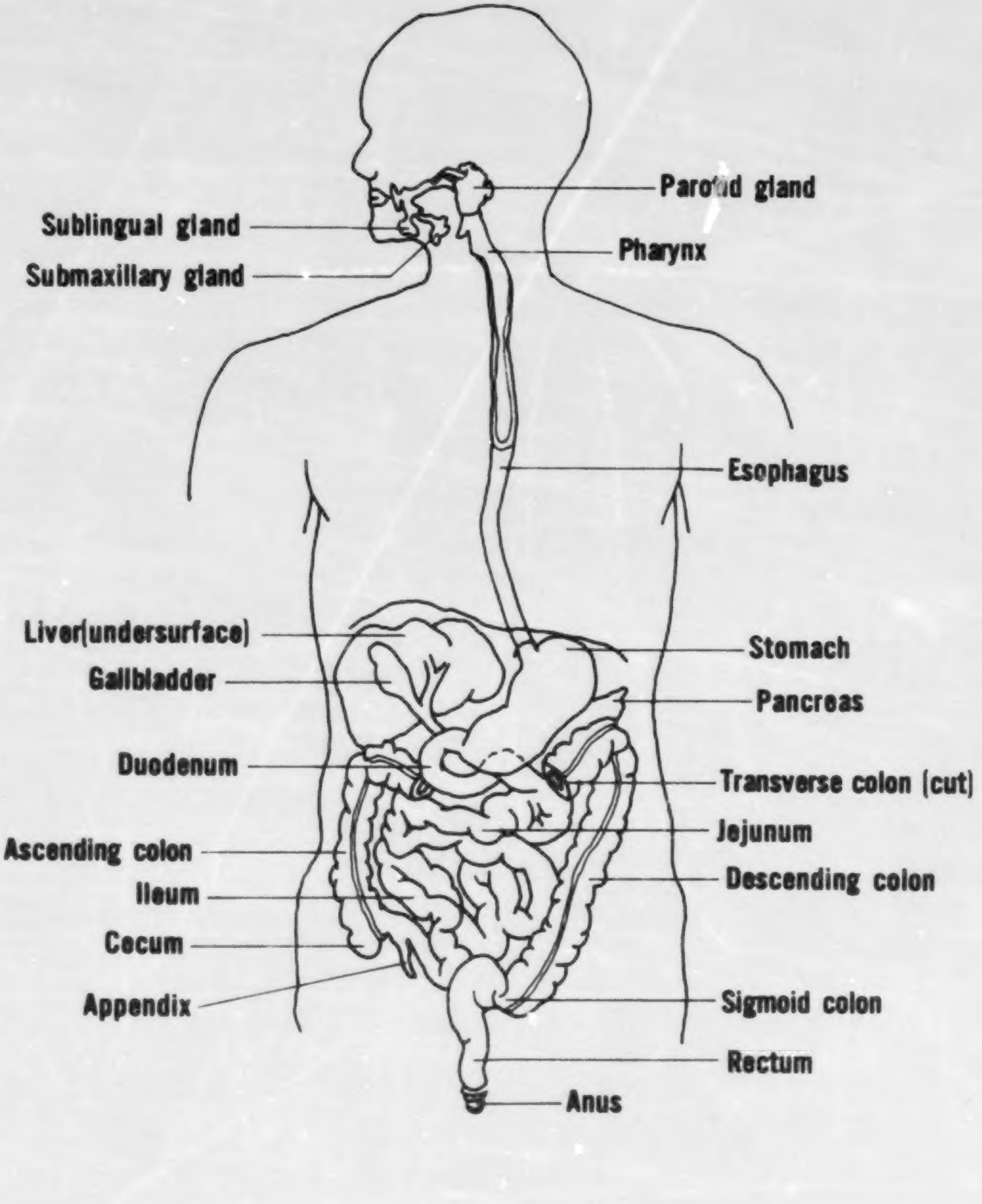
1. Cholecystitis--inflammation of the gall bladder

2. Cholelithiasis--presence of stones in gall bladder

F. Pancreas

1. Diabetes--disease in which sugar is not used by the cells because of a deficiency of insulin. This is not a digestive disorder.
2. Pancreatitis--inflammation of the pancreas

Parts of the Digestive System


Parotid gland
Sublingual gland
Pharynx
Submaxillary gland
Esophagus
Liver(undersurface)
Stomach
Gallbladder
Pancreas
Duodenum
Transverse colon (cut)
Jejunum
Ascending colon
Descending colon
Ileum
Cecum
Appendix
Sigmoid colon
Rectum
Anus

DIGESTIVE JUICES

Digestive juices and enzymes	Source	Place
Saliva	Salivary glands	Mouth
Ptyalin		
Gastric juice	Stomach	Stomach
Pepsin		
Lipase		
Rennin (children)		
Hydrochloric acid		
Pancreatic juice	Pancreas	Small
Trypsin		
Amylopsin		
Lipase		
Intestinal juice	Small intestine	Small
Enterokinase		
Sucrase		
Lactase		
Maltase		
Bile	Liver	Small

ES AND ENZYMES

e of Action	Action of enzyme or digestive juice
h	Begins starch digestion
ach	Begins protein digestion
	Emulsifies fats
	Curdles milk
	Softens connective tissue in meat Kills some pathogenic bacteria Activates gastric enzymes
l intestine	Acts on protein
	Acts on starch
	Acts on fats
l intestine	Acts on protein
	Changes sucrose to simple sugar
	Changes lactose to simple sugar
	Changes maltose to simple sugar
l intestine	Emulsifies fats

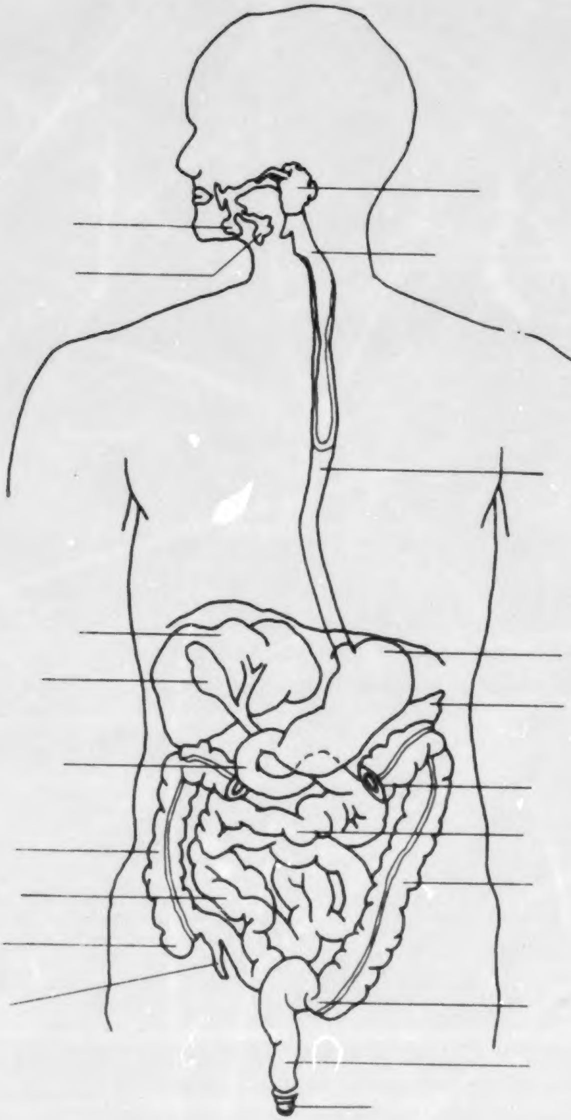
III-TM-2

UNIT III

THE DIGESTIVE SYSTEM

ASSIGNMENT SHEET #1--LABELING PARTS OF THE DIGESTIVE SYSTEM

Directions: Label the indicated parts of the diagram of the digestive system.



UNIT III

THE DIGESTIVE SYSTEM

ASSIGNMENT SHEET #2--IDENTIFYING ENZYMES AND THEIR ACTION

Place the name of the enzyme that acts on each of the foods listed, in the blank spaces provided. Use the enzymes listed below for your answers.

amylopsin
enterokinase
lactase
lipase
maltase
pepsin
ptyalin
rennin
sucrase

ENZYME	SOURCE	ACTION
1. ______________	gastric juice	protein digestion
2. ______________	gastric juice	emulsifies fats
3. ______________	intestinal juice	acts on protein
4. ______________	saliva	begins starch digestion
5. ______________	pancreatic juice	acts on starch
6. ______________	intestinal juice	changes sucrose to simple sugar
7. ______________	gastric juice	curdles milk
8. ______________	intestinal juice	changes maltose to simple sugar
9. ______________	intestinal juice	changes lactose to simple sugar

UNIT III

THE DIGESTIVE SYSTEM

ASSIGNMENT SHEET #3--WORD FIND PUZZLE

Directions: The following terms which are disorders of the digestive system can be found in the puzzle. They may be written forward, backward, vertically, horizontally, or diagonally. Circle each term as you find it.

appendicitis

cancer

cholecystitis

cholelithiasis

cirrhosis

dental caries

diabetes

diarrhea

diverticulitis

dysentery

flatulence

gingivitis

heartburn

hepatitis

mumps

pyloric stenosis

pyorrhea

stomatitis

ulcer

vomiting

WORD FIND PUZZLE

D	P	Y	O	R	R	H	E	A	A	X	T	S	O	P	F	Q
E	A	O	I	C	U	E	S	P	M	U	M	T	U	L	V	R
N	D	O	M	I	J	A	I	F	D	E	D	A	A	C	S	S
T	Y	O	E	R	T	R	A	B	I	Q	R	T	U	S	S	I
A	S	N	R	R	Y	T	O	L	A	P	U	S	G	O	I	S
L	E	Y	T	H	T	B	N	K	B	L	S	W	I	L	T	O
C	N	C	E	O	I	U	J	L	E	G	I	R	N	E	I	N
A	T	N	S	S	R	R	O	N	T	N	T	M	G	C	L	E
R	E	Y	T	I	O	N	C	U	E	I	I	O	I	Y	U	T
I	R	O	Y	S	N	E	O	T	S	T	C	E	V	S	C	S
E	Y	L	G	C	Y	D	N	R	T	I	I	N	I	T	I	C
S	T	O	M	A	T	I	T	I	S	M	D	O	T	I	T	I
O	E	R	O	N	E	C	R	B	J	O	N	I	I	T	R	R
B	C	B	D	C	R	E	C	L	U	V	E	A	S	I	E	O
A	T	F	X	E	S	I	T	I	T	A	P	E	H	S	V	L
D	I	A	R	R	H	E	A	N	Y	Z	P	B	C	R	I	Y
O	C	H	O	L	E	L	I	T	H	I	A	S	I	S	D	P

UNIT III

THE DIGESTIVE SYSTEM

ANSWERS TO ASSIGNMENT SHEET

Assignment Sheet #1 -

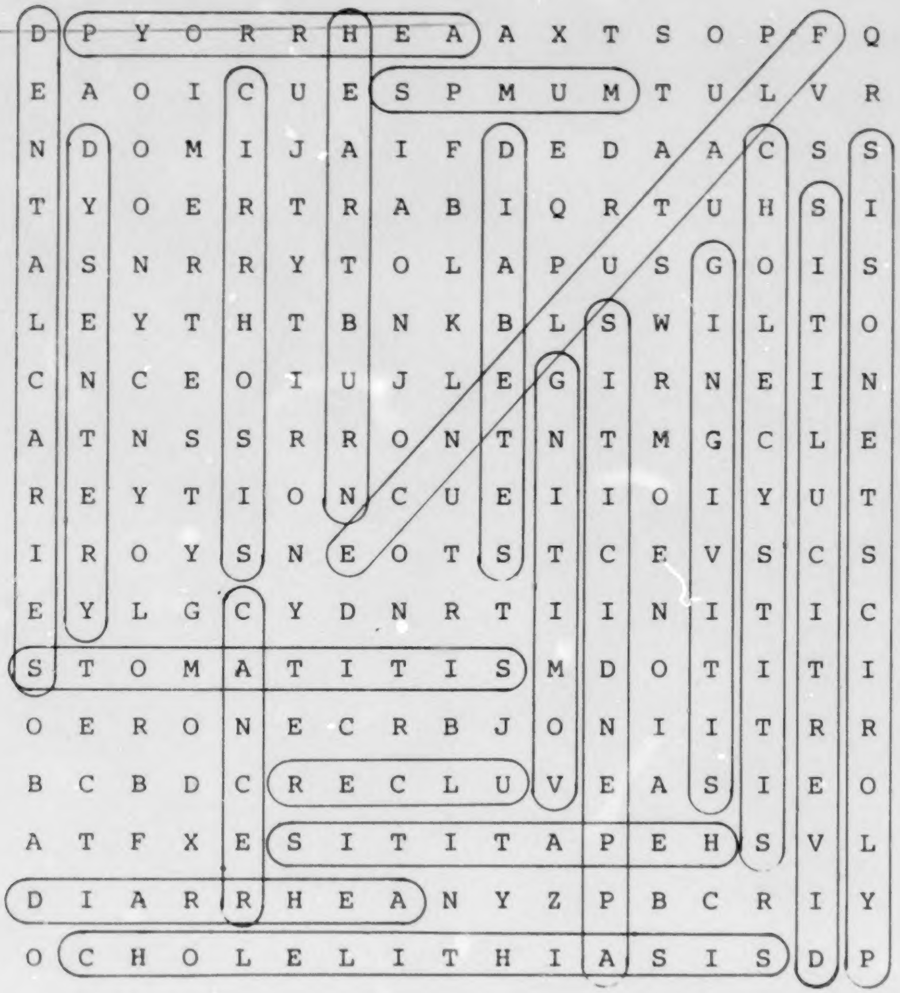
See Transparency Master III-TM-1

Assignment Sheet #2

1. pepsin
2. lipase
3. enterokinase
4. ptyalin
5. amylopsin
6. sucrase
7. rennin
8. maltase
9. lactase

Answer to Assignment Sheet #3

ANSWER TO
WORD FIND PUZZLE



D	P	Y	O	R	R	H	E	A	A	X	T	S	O	P	F	Q
E	A	O	I	C	U	E	S	P	M	U	M	T	U	L	V	R
N	D	O	M	I	J	A	I	F	D	E	D	A	A	C	S	S
T	Y	O	E	R	T	R	A	B	I	Q	R	T	U	H	S	I
A	S	N	R	R	Y	T	O	L	A	P	U	S	G	O	I	S
L	E	Y	T	H	T	B	N	K	B	L	S	W	I	L	T	O
C	N	C	E	O	I	U	J	L	E	G	I	R	N	E	I	N
A	T	N	S	S	R	R	O	N	T	N	T	M	G	C	L	E
R	E	Y	T	I	O	N	C	U	E	I	I	O	I	Y	U	T
I	R	O	Y	S	N	E	O	T	S	T	C	E	V	S	C	S
E	Y	L	G	C	Y	D	N	R	T	I	I	N	I	T	I	C
S	T	O	M	A	T	I	T	I	S	M	D	O	T	I	T	I
O	E	R	O	N	E	C	R	B	J	O	N	I	I	T	R	R
B	C	B	D	C	R	E	C	L	U	V	E	A	S	I	E	O
A	T	F	X	E	S	I	T	I	T	A	P	E	H	S	V	L
D	I	A	R	R	H	E	A	N	Y	Z	P	B	C	R	I	Y
O	C	H	O	L	E	L	I	T	H	I	A	S	I	S	D	P

UNIT III

THE DIGESTIVE SYSTEM

UNIT TEST

1. Match the terms relating to the digestive system to the correct definition, using number answers.

_____ a. Chewing

_____ b. Body waste, residue of digestion, discharged from anus

_____ c. Chemical form in which extra carbohydrate is stored in the liver

_____ d. Wavelike motion of the muscle tissue of the alimentary canal which moves food through the digestive tract

_____ e. The taking up of fluids or other substances by the skin or mucous membrane

_____ f. Digestive juice secreted by the liver

_____ g. The act of swallowing

_____ h. Compound produced by the liver which prevents blood clotting

_____ i. Folds-particularly the folds of the mucous membrane lining the stomach

_____ j. The changing of insoluble food materials to a soluble form by the action of enzymes

1. Absorption
2. Alimentary canal
3. Bile
4. Bolus
5. Chyme
6. Defecation
7. Deglutition
8. Digestion
9. Enzyme
10. Feces
11. Glycogen
12. Heparin
13. Malnutrition
14. Mastication
15. Peristalsis
16. Rugae

_____ k. The continuous tube which extends from the mouth to the anus. The process of digestion takes place in this tube.

_____ l. The lack of needed food in the body or improper absorption and distribution of food by the body

_____ m. The protein substances produced by the cells that bring about chemical reactions in digestion

_____ n. A rounded mass of chewed food ready to be swallowed

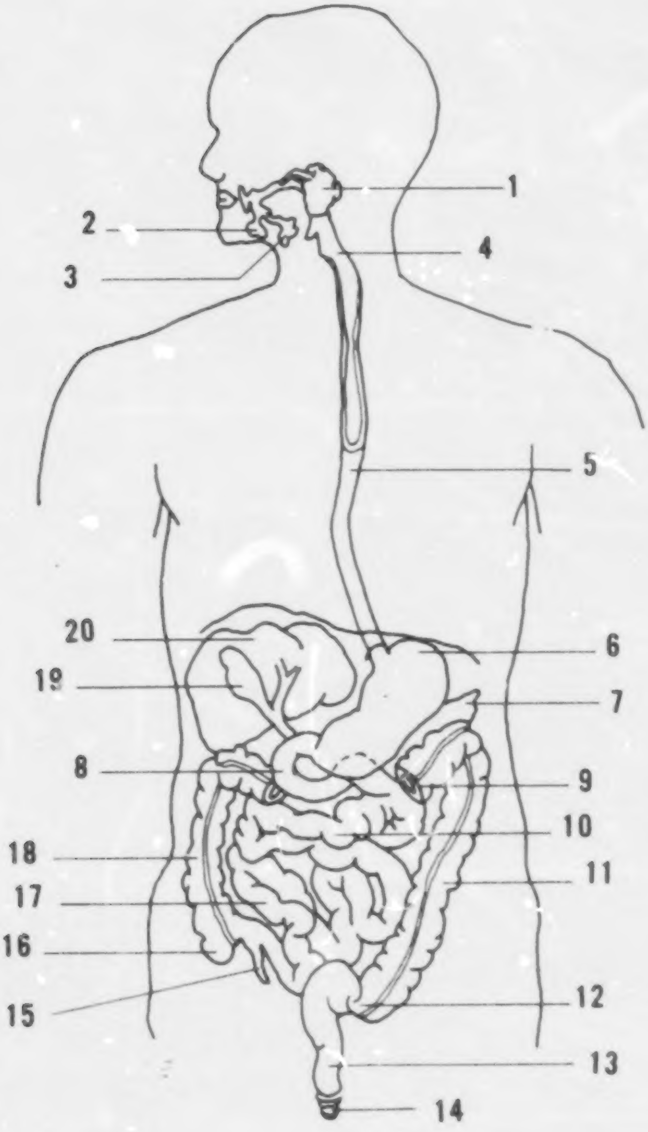
_____ o. The discharge of fecal material from [illegible] rectum

_____ p. The material formed by the mixing and partial digestion of food in the stomach

2. A. Label the indicated parts of the diagram of the digestive system.

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________
9. ____________________
10. ____________________
11. ____________________
12. ____________________
13. ____________________
14. ____________________
15. ____________________
16. ____________________
17. ____________________
18. ____________________
19. ____________________
20. ____________________

Parts of the Digestive System


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

2. B. Give the function of each part of the digestive system by writing the name of the appropriate part in the blank space in front of each function. Each part will be used more than once.

Function

Example

mouth______ a. Receives food

__________ b. Completes digestion begun in stomach

__________ c. Absorbs water

__________ d. Secretes bile

__________ e. Churns food by contraction of muscles

__________ f. Grind, crush, shred, or tear food

__________ g. Speech

__________ h. Prepares food for digestion

__________ i. Dissolves food in mouth

__________ j. Secretes gastric juices

__________ k. Removes poisons absorbed from intestine

__________ l. Secretes pancreatic juice

__________ m. Manufactures insulin

__________ n. Stores and concentrates bile

__________ o. Eliminates wastes of digestion

Digestive Part

- mouth
- tongue
- teeth
- salivary glands
- stomach
- small intestine
- liver
- gall bladder
- pancreas

________________ p. Manufactures heparin

________________ q. Absorbs end products of digestion into blood and lymph

________________ r. Carries on limited absorption of water, alcohol, and some drugs

________________ s. Makes it easier to chew food

________________ t. Secretes bile

________________ u. Ejects bile into duodenum as needed during digestion

________________ v. Contains the enzyme, ptyalin, which digests starch

________________ w. Contains taste buds, which identify sweet, salt, sour, and bitter tastes

________________ x. Metabolizes carbohydrates, proteins, and fats

________________ y. Stores iron, Vitamins A, B_{12}, and D

________________ z. Forms antibodies

3. The chart of digestive juices and enzymes has some lettered blank spaces. Place the correct answer in the following lettered spaces.

a.

b.

c.

d.

e.

f.

g.

h.

i.

j.

DIGESTIVE JUICES AND ENZYMES

Digestive juices and enzymes	Source	Place of Actio
Saliva Ptyalin	Salivary glands	a
Gastric juice Pepsin b Rennin (children) Hydrochloric acid	Stomach	Stomach
Pancreatic juice e Amylopsin Lipase	d	Small intestine
Intestinal juice Enterokinase h Lactase Maltase	Small intestine	Small intestine
Bile	j	Small intestine

ES

ion	Action of enzyme or digestive juice
	Begins starch digestion
	Begins protein digestion
	Emulsifies fats
	_________c_________
	Softens connective tissue in meat Kills some pathogenic bacteria Activates gastric enzymes
ne	Acts on protein
	Acts on ____f________
	Acts on fats
ne	Acts on ____g________
	Changes sucrose to simple sugar
	Changes lactose to simple sugar
	Changes____i____to simple sugar
e	Emulsifies fats

4. Identify each of the following disorders of the digestive tract.

   a. Dental caries--

   b. Gingivitis--

   c. Pyorrhea--

   d. Stomatitis--

   e. Mumps--

   f. Flatulence--

   g. Gastritis--

   h. Heartburn--

   i. Nausea--

   j. Pyloric stenosis--

   k. Stomach cancer--

   l. Ulcer--

   m. Vomiting--

   n. Appendicitis--

   o. Constipation--

   p. Diarrhea--

q. Dysentery--

r. Diverticulitis--

s. Cirrhosis--

t. Hepatitis--

u. Cholecystitis--

v. Cholelithiasis--

w. Pancreatitis--

x. Diabetes--

5. Locate parts of the digestive system on a diagram
6. Identify enzymes
7. Recognize names of digestive disorders

(NOTE: If activities #5 - #7 have not been completed prior to the test, ask the instructor when they should be completed.)

UNIT III

THE DIGESTIVE SYSTEM

ANSWERS TO UNIT TEST

1. 14 a.
 10 b.
 11 c.
 15 d.
 1 e.
 3 f.
 7 g.
 12 h.
 16 i.
 8 j.
 2 k.
 13 l.
 9 m.
 4 n.
 6 o.
 5 p.

2. A.

1. parotid gland
2. sublingual gland
3. submaxillary gland
4. pharynx
5. esophagus
6. stomach
7. pancreas
8. duodenum
9. transverse colon
10. jejunum
11. descending colon
12. sigmoid colon
13. rectum
14. anus
15. appendix
16. cecum
17. ileum
18. ascending colon
19. gall bladder
20. liver

2. B.

a. mouth

b. small intestine

c. large intestine

d. liver

e. stomach

f. teeth

g. tongue

h. mouth

i. saliva

j. stomach

k. liver

l. pancreas

m. pancreas

n. gall bladder

o. large intestine

p. liver

q. small intestine

r. stomach

s. saliva

t. liver

u. gall bladder

v. saliva

w. tongue

x. liver

y. liver

z. liver

3.

1. mouth
2. lipase
3. curdles milk
4. pancreas
5. trypsin
6. starch
7. protein
8. sucrase
9. maltose
10. liver

4.

a. tooth decay

b. infection of gum

c. inflammation of tooth socket

d. infection of lining of mouth

e. viral infection of salivary glands

f. excessive amount of gas in stomach or intestine

g. inflammation of the lining of the stomach

h. burning sensation in cardiac portion of stomach

i. feeling of illness following distention or irritation of the stomach as a result of mechanical or nervous factors

j. abnormal constriction of the pyloric valve

k. malignant tumor of the lining of the stomach

l. an area of mucous membrane in which the tissues are gradually disintegrating

m. reverse peristalsis causing ejection of the stomach contents through the mouth

n. inflammation of the appendix

o. abnormal delay in, or infrequent bowel movements

p. abnormally frequent, watery, bowel movements

q. inflammation of mucosal lining of intestines

r. inflammation of the diverticuli (distended sacs) of the colon

s. chronic disease in which active liver cells are replaced by scar tissue

t. inflammation of the liver

u. inflammation of the gall bladder

v. presence of stones in the gall bladder

w. inflammation of the pancreas

x. disease in which sugar is not used by the cells because of a deficiency of insulin

5. Evaluated to the satisfaction of the instructor

6. Evaluated to the satisfaction of the instructor
7. Evaluated to the satisfaction of the instructor

UNIT IV

THE CIRCULATORY SYSTEM

UNIT OBJECTIVE

After completing this unit, the student will be able to identify, describe, and give the function of each part of the circulatory system. The student will also be able to name the components of blood and lymph, explain the importance of ABO and Rh blood groups, and identify common circulatory disorders. This knowledge will be evidenced through demonstration and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Discuss the functions of blood
2. Describe the components of blood
3. Explain the determination of ABO blood types and give reasons for typing blood
4. Discuss the importance of the Rh factor
5. List in sequence the basic steps in the clotting of blood
6. Identify the parts of the heart in a diagram
7. Explain the conduction system of the heart
8. Define pulse and blood pressure
9. List types of blood vessels
10. Differentiate among pulmonary, systemic, and portal circulation
11. Discuss lymph, lymphatics, lymph nodes, and lymphatic tissues
12. Identify definitions of diseases and disorders of the circulatory system
13. Answer questions about compatibility of ABO blood groups

14. Label the parts of the diagram of the heart.

15. Trace the course of the blood through the heart.

16. Identify names of diseases and disorders of circulatory system included in puzzle.

UNIT IV

THE CIRCULATORY SYSTEM

SUGGESTED ACTIVITIES

I. Instructor

   A. Provide objective sheet

   B. Discuss objective sheet

   C. Pass out information sheet

   D. Discuss information sheet

   E. Make and show transparencies

   F. Distribute and discuss assignment sheets

   G. Use model to point out parts of heart

   H. Give test and evaluate results

II. Student

   A. Read objective sheet

   B. Discuss objective sheet

   C. Read material contained in information sheet

   D. Discuss information sheet

   E. Complete assignment sheets

   F. Observe or participate in demonstration of parts of heart, using model

   G. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

   A. Objectives

   B. Information sheet

   C. Transparency masters

1. IV-TM-1--Reactions of ABO Groups in Crossmatching Prior to Transfusion
2. IV-TM-2--The Heart

D. Assignment Sheets

1. Assignment Sheet #1--Compatible ABO Blood Groups
2. Assignment Sheet #2--Diagram of Heart
3. Assignment Sheet #3--The Course of Blood Through the Heart
4. Assignment Sheet #4--Scrambled Letter Puzzle

E. Answers to assignment sheets

F. Test

G. Answers to test

II. References

A. Books

1. Anderson, Paul D. Clinical Anatomy and Physiology for Allied Health Sciences. Philadelphia, Pennsylvania: W.B. Saunders, 1976.

2. Anthony, Catherine Parker and Irene B. Alyn. Structure and Function of the Body. 5th ed. St. Louis, Missouri: C.V. Mosby Company, 1976.

3. Anthony, Catherine Parker and Norma Jane Kolthoff. Textbook of Anatomy and Physiology. 9th ed. St. Louis, Missouri, C.V. Mosby Company, 1975.

4. Jacob, Stanley W. and Clarice Ashworth Francone. Structure and Function in Man. 3rd ed. Philadelphia, Pennsylvania: W.B. Saunders Company, 1974.

5. Jorow, Marie. The Central Service Technician at Work. New York, New York: Springer Publishing Company, 1975.

6. Memmler, Ruth Lundeen and Dena Lin Wood. *The Human Body in Health and Disease*. 4th ed. Philadelphia, Pennsylvania: J.B. Lippincott Company, 1977.

UNIT IV

THE CIRCULATORY SYSTEM

INFORMATION SHEET

I. Functions of blood

  A. Transportation

    1. Blood carries oxygen and nutrients from digestive and respiratory systems, and delivers them to each cell.

    2. From cells, blood transports waste products of metabolism to excretory organs

      a. carbon dioxide from cells to lungs

      b. waste to kidneys

    3. Transports hormones from endocrine glands to cells and tissues

    4. Helps regulate and equalize body temperature by distributing heat to body parts.

  B. Defense against disease

    1. White blood cells combat bacterial invasion

    2. Antibodies

II. Components of blood

  A. Plasma--liquid part of blood

    1. Water

    2. Proteins

      a. Albumins

      b. Globulins

      c. Fibrinogen

    3. Food substances as glucose, amino acids, lipids

    4. Compounds formed by metabolism, as urea, uric acid, creatinine, and lactic acid

5. Respiratory gases as carbon dioxide and oxygen
6. Regulatory substances as hormones and enzymes

B. Formed elements

1. Erythrocytes (red blood cells)
    - a. Characteristics
        1. Biconcave disc shape
        2. Non-nucleated
        3. 4,500,000-5,000,000/per cu. mm of blood
        4. 7 microns in diameter
        5. Contain hemoglobin, a blood protein
        6. Formed in red bone marrow
    - b. Functions
        1. Transport oxygen from lungs to each cell in the body
        2. Transport carbon dioxide from tissues back to lungs for expiration
2. Leucocytes (white blood cells)
    - a. Nucleated
    - b. 5,000-10,000/cu. mm. of blood
    - c. Capable of amoeboid motion
    - d. Types
        1. Granulocytes--cytoplasm contains granules.
            - a) Formed in bone marrow
            - b) Types are neutrophiles, eosinophiles, and basophiles
        2. Agranulocytes--lack granules in cytoplasm
            - a) Formed in bone marrow, lymph glands and lymphatic tissue

b) Types are monocytes and lymphocytes

c) Functions:

1) Destroy invading bacteria

2) Lymphocytes play an important role in the development of immunity

3. Platelets (thrombocytes)

a. Small fragments of specialized bone marrow cells

b. 150,000 to 300,000/cu. mm. of blood

c. Capable of ameboid motion

d. Required for clotting of blood

III. ABO Blood types-- based on presence of antigen on surface membrane of red blood cells and corresponding antibodies in blood serum

A.

	Antigen on rbc	Antibody in serum
1. Type A	A	anti-B
2. Type B	B	anti-A
3. Type O	no antigen present	anti B & anti A
4. Type AB	A&B	neither anti-B nor anti-A

B. Importance of ABO blood type determination

1. Transfusion of imcompatible blood causes agglutination of red blood cells with severe reaction or death of recipients.

2. Medical-legal identification

IV. Rh factor--protein factor on red blood cells

A. Rh positive blood means Rh antigen is present on red blood cells.

B. Rh negative blood means no Rh antigen is present on red blood cells.

1. Possible problems encountered by Rh negative patients
    a. Transfusion--Rh negative patient transfused with Rh positive blood may develop Rh antibodies. If subsequent transfusions of Rh positive blood are given, an antigen-antibody reaction may occur.
    b. Pregnancy
        1. An Rh negative mother pregnant with an Rh positive baby may form Rh positive antibodies.
        2. Subsequent pregnancy with Rh positive baby may result in an antigen-antibody reaction.
2. RhoGAM--a commercially prepared serum is used to prevent maternal antibody production

V. Blood coagulation--prevents blood loss when a blood vessel is ruptured by injury.

- A. Injured tissues release thromboplastin, which triggers the clotting mechanism.
- B. Thromboplastin reacts with certain protein factors and calcium ions to form a prothrombin activator. This reacts with calcium ions to convert prothrombin to thrombin.
- C. Thrombin converts soluble fibrinogen to insoluble fibrin--which forms network that traps red blood cells forming a clot.

VI. Heart structure and function

- A. Layers of heart
    1. Endocardium--lining of interior of heart
    2. Myocardium--muscle of the heart
    3. Pericardium--outer covering of the heart
- B. Cavities of heart
    1. Septum--muscular partition separating the right and left sides of the heart
    2. Right atrium--upper chamber of heart which

receives venous blood returning to heart from body tissues

3. Right ventricle--lower chamber which receives blood from right atrium, then sends blood to lungs

4. Left atrium--receives blood high in oxygen content from the lungs

5. Left ventricle--receives blood from left auricle, pumps oxygenated blood to body

C. Valves of heart--prevent backward flow of blood

1. Tricuspid--valve between right atrium and right ventricle

2. Pulmonary semilunar--valve between right ventricle and pulmonary artery

3. Mitral--valve between left atrium and left ventricle

4. Aortic semilunar--valve between left ventricle and aorta

D. Function of heart

1. Pumps blood in sufficient amounts to meet the needs of the cells

2. The atria contract, forcing blood into ventricles.

3. At the end of atrial contraction, the ventricles contract, forcing the blood out of the ventricles.

4. Blood from right ventricle is forced into the pulmonary artery. Blood from the left ventricle is forced into the aorta.

VII. Conduction system--composed of cardiac muscle modified to conduct impulses

A. Sinoatrial node (pacemaker)--located in the upper wall of right atrium, initiates heartbeat and sets its pace.

B. Impulses travel through the muscle fibers of both atria causing them to contract.

C. The atrioventricular node located in lower part of right atrial wall is stimulated next, the impulse is transmitted to bundle of His, and spreads to all parts of ventricle walls.

D. Ventricles contract forcing blood from heart.

VIII. Pulse and blood pressure

A. Pulse is the waves of increased pressure in arteries as a result of ventricular contraction. (alternate expansion and recoil of an artery)

1. Pressure point--points where pressure may be applied to stop arterial bleeding. Points where pulse may be felt. Point where artery lies near surface, and near a bone that can act as a firm background for pressure.

2. Factors that influence pulse rate

a. Body size

b. Muscular activity

c. Emotional disturbances

d. Infections

e. Excessive secretion from thyroid

B. Blood pressure--pressure blood exerts on inside of walls of blood vessels

1. Systolic--pressure during heart muscle contraction

2. Diastolic--pressure which occurs during relaxation of heart muscle

IX. Blood Vessels

A. Types

1. Arteries--carry blood from heart to body

2. Veins--carry blood from body parts to heart

3. Capillaries--microscopic vessels that connect arteries and veins

X. Pulmonary, systemic and portal systems

A. Pulmonary circulation--the pulmonary artery carries blood containing carbon dioxide from the heart to the lungs. Oxygenated blood is returned to the heart from the lungs by the pulmonary vein.

B. Systemic circulation--arteries and veins carry oxygen and nutrients to all tissue of body except the lungs and carry waste materials for disposal from all tissues except the lungs.

C. Portal circulation--blood from abdominal organs passes through the liver. Substances in blood are processed by the liver.

XI. The lymphatic system

A. Lymph-- is clear, watery fluid found in lymphatic vessels. It closely resembles blood plasma, but contains a lower percentage of protein.

B. Lymphatics--vessels that contain lymph.

1. Lymphatics originate as capillaries in tissue spaces. Capillaries drain into lymph vessels.

C. Lymph nodes--small masses of lymphatic tissue

1. Located throughout body along lymph vessels. They also occur in clusters in some areas of the body as cervical, inguinal, axillary, mesenteric, and tracheo-bronchial regions.

2. Filter injurious substances from blood and phagocytize them.

3. Lymphocytes and monocytes are formed in lymph nodes.

D. Lymphatic tissues

1. Tonsils--protect entrance to alimentary and respiratory tracts from bacterial invasion.

2. Thymus

a. Located superiorally in chest between aorta and sternum.

b. Larger in young children--gradually atrophies.

c. Produces lymphocytes and antibodies.

3. Spleen

    a. Located left hypochondrium

    b. Serves as blood reservoir

    c. Produces antibodies

    d. Produces red blood cells

    e. Destroys effete blood cells

XII. Diseases and disorders of the circulatory system

A. Anemia--general condition in which the blood is deficient in the number of red blood cells or in hemoglobin

B. Aneurysm--abnormal dilatation of blood vessels

C. Angina pectoris--severe chest pain

D. Arteriosclerosis--thickening, hardening, and loss of elasticity of walls of blood vessels, especially arteries

E. Atherosclerosis--a disorder of the lining of arteries in which fat is deposited forming plaques that diminish the width of the vessel

F. Coronary occlusion--closing off of a coronary artery

G. Coronary thrombosis--closing of the coronary artery by a blood clot

H. Embolus--a blood clot or foreign material carried by the blood stream into a small vessel causing its obstruction

I. Endocarditis--inflammation of the lining of the heart

J. Gangrene--death of tissue due to lack of blood supply, usually accompanied by bacterial invasion

K. Hemorrhage--copius bleeding

L. Hypertension--high blood pressure

M. Ischemia--insufficient blood supply to a given part of the body

N. Murmur--abnormal heart sound

O. Pericarditis--inflammation of the pericardium

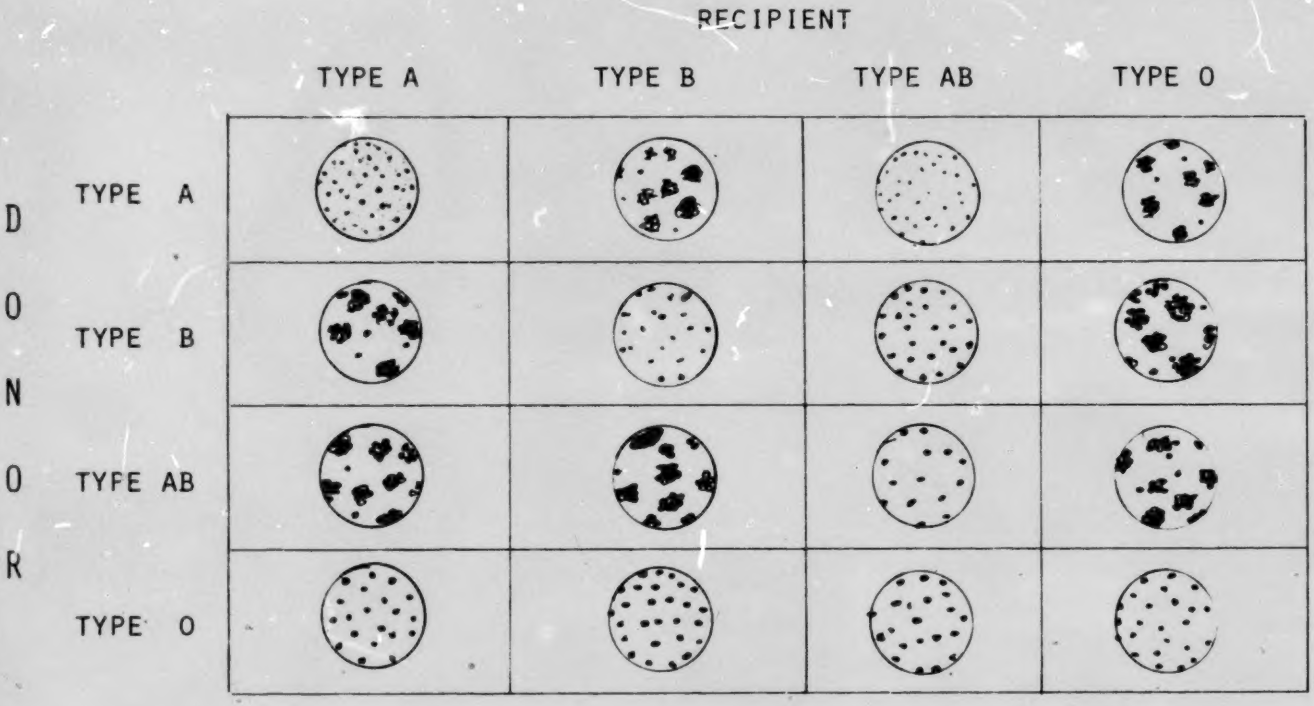
P. Phlebitis--inflammation of a vein

Q. Rheumatic fever--disease in which the joints and the heart may become involved as a result of streptococcal infection

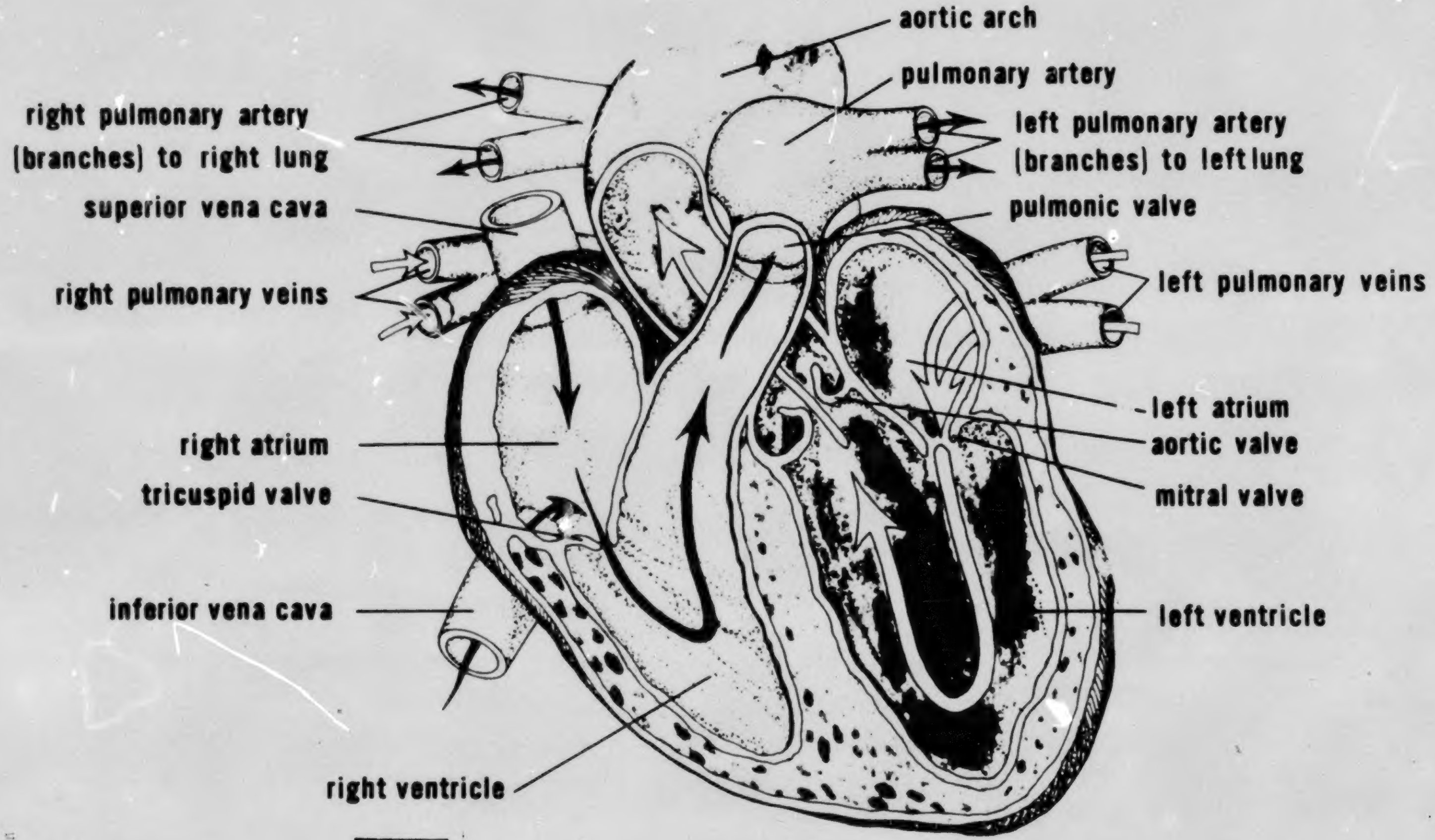
R. Thrombus--blood clot

S. Varicose veins--dilatation of veins, usually in lower extremities

REACTIONS OF ABO BLOOD GROUPS IN CROSSMATCHING PRIOR TO TRANSFUSION


RECIPIENT
TYPE A
TYPE B
TYPE AB
TYPE O
DONOR
TYPE A
TYPE B
TYPE AB
TYPE O

THE HEART


aortic arch
pulmonary artery
right pulmonary artery (branches) to right lung
left pulmonary artery (branches) to left lung
superior vena cava
pulmonic valve
right pulmonary veins
left pulmonary veins
left atrium
right atrium
aortic valve
tricuspid valve
mitral valve
inferior vena cava
left ventricle
right ventricle

☐ Blood low in oxygen (venous)

▨ Blood high in oxygen (arterial)

UNIT IV

THE CIRCULATORY SYSTEM

ASSIGNMENT SHEET #1--COMPATIBLE ABO BLOOD GROUPS

Directions: Answer the following questions by referring to the chart.

	Recipient			
	Type A	Type B	Type AB	Type O
Type A	-	+	-	+
Type B	+	-	-	+
Type AB	+	+	-	+
Type O	-	-	-	-

+ = agglutination

- = no agglutination

1. What types of blood could be given to a Type A recipient? ____________

2. What types of blood may not be given to a Type B recipient? ____________

3. What types of blood may be given a Type O recipient?

   ____

4. what types of blood may be given a Type AB recipient?

   ____

5. What types of blood may be given to a Type B recipient?

   ____

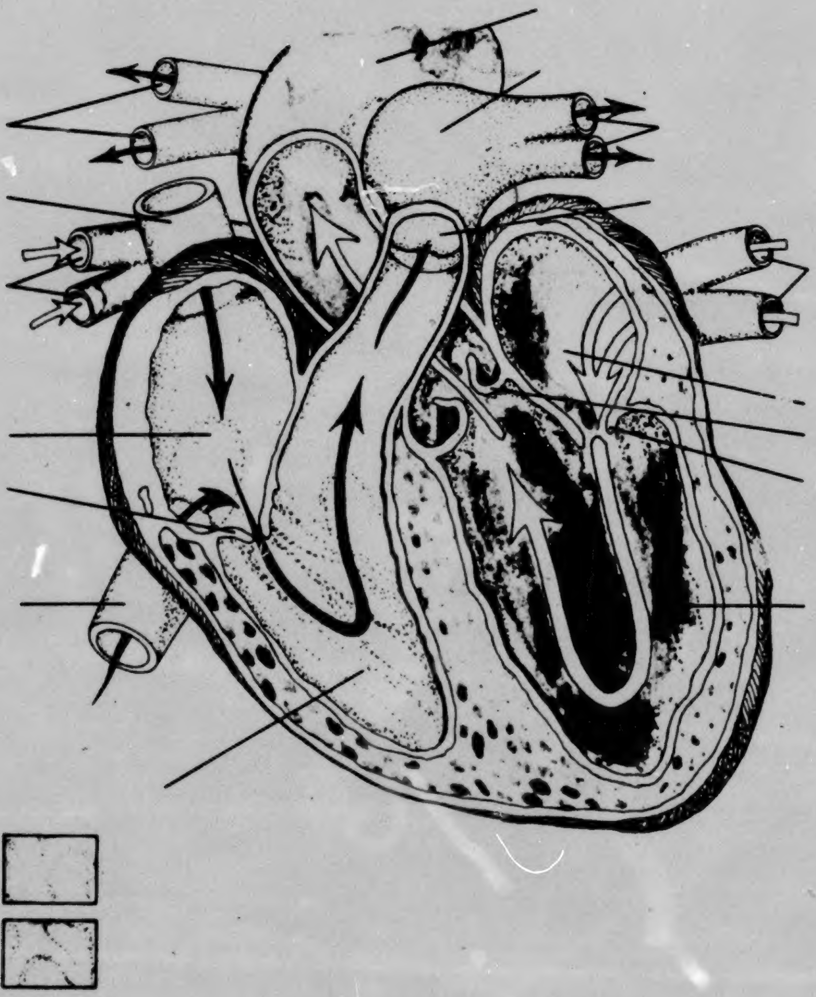
UNIT IV

THE CIRCULATORY SYSTEM

ASSIGNMENT SHEET #2--DIAGRAM OF HEART

Directions: Label the parts of the diagram of the heart.

THE HEART



UNIT IV

THE CIRCULATORY SYSTEM

ASSIGNMENT SHEET #3--COURSE OF BLOOD THROUGH THE HEART

Directions: Trace the course of the blood through the heart by filling in the blanks in the following paragraph with the name of the appropriate chamber or valve.

The blood returns to the heart by means of the superior and inferior vena cava. It enters the (1) ______________, passes through the (2) ______________ valve to the (3) _______________. It flows through the (4) __________ valve, thence through the pulmonary arteries to the lungs where the blood loses carbon dioxide and gets a supply of oxygen. The oxygenated blood returns to the heart by means of the pulmonary vein, enters the (5) ____________ of the heart. Then it flows through the (6) ____________ valve to the (7) ______________. Finally, the blood passes through the (8) __________ valve to the aorta and thence to the body.

UNIT IV

THE CIRCULATORY SYSTEM

ASSIGNMENT SHEET #4--SCRAMBLED LETTER PUZZLE

Directions: Unscramble the letters below to form the names of disorders of the circulatory system which are defined below.

1. ysmeuran _ _ _ _ _ _ _ _
2. starreiclosieosr _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
3. sidendarcoti _ _ _ _ _ _ _ _ _ _ _ _
4. engregan _ _ _ _ _ _ _ _
5. subrtomh _ _ _ _ _ _ _ _ _
6. biplheist _ _ _ _ _ _ _ _ _
7. rmuumr _ _ _ _ _ _
8. chismaie _ _ _ _ _ _ _ _
9. ghoremrhae _ _ _ _ _ _ _ _ _ _
10. tnpesniorhye _ _ _ _ _ _ _ _ _ _ _ _

1. abnormal dilatation of a blood vessel
2. thickening, hardening, and loss of elasticity of blood vessels, especially arteries
3. inflammation of the lining of the heart
4. death of tissue due to lack of blood supply, usually accompanied by bacterial invasion
5. a blood clot
6. inflammation of a vein
7. abnormal heart sound
8. insufficient blood supply to a given part of the body
9. copius bleeding
10. high blood pressure

3

UNIT IV

THE CIRCULATORY SYSTEM

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1

1. Types A, O*
2. Types A, AB*
3. Type O
4. Type A*, B*, AB, O*
5. Type B, O*

*In actual practice blood is usually given only to recipients of same type as donors.

Assignment Sheet #2

Labeled diagram of heart

Assignment Sheet #3

(1) Right atrium

(2) Tricuspid

(3) Right ventricle

(4) Pulmonary

(5) Left atrium

(6) Mitral (bicuspid)

(7) Left ventricle

(8) Aortic

Assignment Sheet #4

1. aneurysm
2. arteriosclerosis
3. endocarditis
4. gangrene

5. thrombus
6. phlebitis
7. murmur
8. ischemia
9. hemorrhage
10. hypertension

UNIT IV

THE CIRCULATORY SYSTEM

UNIT TEST

1. Discuss the functions of blood.

2. Describe the components of blood.

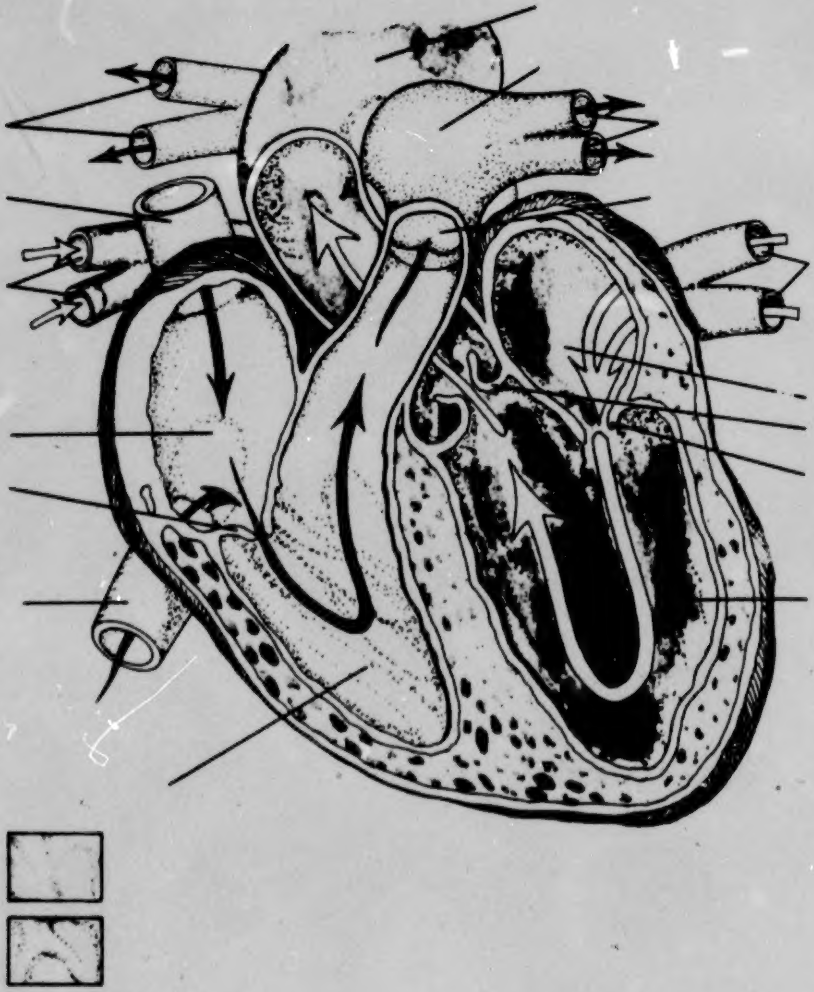
3. Explain the determination of ABO blood types and give reasons for typing blood.

4. Discuss the importance of the Rh factor.

5. List in sequence the basic steps in the clotting of blood.

6. Identify the parts of the heart on a diagram.

THE HEART



7. Explain the conduction system of the heart.

8. Define:

    a. pulse--

    b. blood pressure--

9. List the types of blood vessels.

10. Differentiate among pulmonary, systemic, and portal circulation.

11. Discuss lymph, lymphatics, lymph nodes, and lymphatic tissues.

UNIT IV

THE CIRCULATORY SYSTEM

ANSWERS TO UNIT TEST

1. a. Transportation

    (1) Blood carries oxygen and nutrients from the digestive and respiratory systems and delivers them to each cell.

    (2) From cells, the blood transports the waste products of metabolism to the excretory organs. Carbon dioxide is taken from the cells to the lungs. Other wastes are taken from the cells to the kidneys.

    (3) Blood transports hormones from endocrine glands to cells and tissues.

    (4) Helps regulate and equalize body temperature by distributing heat to body parts.

   b. Defense against disease

    (1) White blood cells

    (2) Antibodies

2. a. Plasma--the liquid part of blood. Composed of water and proteins, albumin, globulin, and fibrinogen. Plasma contains the following substances:

    (1) Food substances as glucose, amino acids, and lipids

    (2) Compounds formed by metabolism, as urea, uric acid, creatinine, and lactic acid

    (3) Respiratory gases as carbon dioxide and oxygen

    (4) Regulatory substances as hormones and enzymes

   b. Formed elements

    (1) Erythrocytes (red blood cells)

     a) Biconcave disc shape

     b) Non-nucleated

     c) 4,500,000-5,000,000 per cu. mm of blood

d) 7 microns in diameter

e) Contain hemoglobin-a blood protein

f) Formed in red bone marrow

g) Transport oxygen from lungs to body cells and carbon dioxide from cells to lungs

(2) Leucocytes (white blood cells)

a) Nucleated

b) 5,000-10,000/cu. mm of blood

c) Capable of ameboid motion

d) Granulocytes-cytoplasm of cells contains granules

1) Formed in bone marrow

2) Types are neutrophiles, eosinophiles, and basophiles

e) Agranulocytes--lack granules in cytoplasm

1) Formed in bone marrow, lymph glands, or lymphatic tissue

2) Types are monocytes and lymphocytes

f) Functions

1) Destroy invading bacteria

2) Lymphocytes play an important role in the development of immunity

(3) Platelets (thrombocytes)

a) Small fragments of specialized bone marrow cells

b) 150,000-300,000/cu. mm of blood

c) Capable of ameboid motion

d) Required for clotting of blood

3. ABO blood types are based on the presence or absence of antigen on the surface membrane of red blood cells, and the presence or absence of corresponding antibodies in blood serum.

	Antigen on red blood cell	Antibody in serum
Type A	A	anti-B
Type B	B	anti-A
Type O	no antigen present	anti-B and anti-A
Type AB	A&B	neither anti-B nor anti-A

Blood typing is used in medical-legal identification.

4. Rh positive blood means that the Rh antigen is present on red blood cells.

   Rh negative means no Rh antigen is present on red blood cells.

   The Rh factor may be of importance when an Rh negative patient is transfused with Rh positive blood, because the patient may produce Rh positive antibodies. If a subsequent transfusion of Rh positive blood is given, an antigen-antibody reaction may occur.

   In pregnancy, an Rh negative mother with an Rh positive baby may form Rh positive antibodies. A subsequent pregnancy with Rh positive baby may result in an antigen-antibody reaction.

   RhoGAM, a commercially prepared serum is used to prevent maternal antibody production.

5. a. Injured tissues release thromboplastin which triggers the clotting mechanism.

   b. Thromboplastin reacts with certain protein factors and calcium ions to form prothrombin activator. This reacts with calcium ions to convert prothrombin to thrombin.

   c. Thrombin converts soluble fibrinogen to insoluble fibrin, which forms a network that traps red blood cells forming a clot.

6. See Transparency Master IV-TM-2

7. a. The sinoatrial node (pacemaker), located in the upper wall of the right atrium, initiates the heartbeat and sets its pace.

   b. Impulses travel through the muscle fibers of both atria causing them to contract.

   c. The atrioventricular node, located in the lower part of the right atrial wall, is stimulated next, the impulse is transmitted to the bundle of His, and spreads to all parts of ventricle walls.

   d. Ventricles contract forcing blood from the heart.

8. a. Pulse is the wave of increased pressure in arteries as a result of ventricular contraction.

   b. Blood pressure is pressure blood exerts on the inside walls of blood vessels.

9. a. Arteries

   b. Veins

   c. Capillaries

10. a. Pulmonary circulation--the pulmonary artery carries blood containing carbon dioxide from the heart to the lungs. Oxygenated blood is returned to the heart from the lungs by the pulmonary vein.

    b. Systemic circulation--arteries and veins carry oxygen and nutrients to all tissues of the body except the lungs, and carry waste materials for disposal from all tissues except the lungs.

    c. Portal circulation--blood from abdominal organs passes through the liver. Substances in the blood are processed by the liver.

11. Lymph--clear, watery fluid found in lymphatic vessels. It contains less protein than blood plasma.

    Lymphatics--vessels that contain lymph

    Lymph nodes--small masses of lymphatic tissue located throughout the body along lymph vessels. They filter injurious substances from the blood and phagocytize them. Lymphocytes and monocytes are formed in lymph nodes.

    Lymphatic tissues:

tonsils--which protect the entrance to alimentary and respiratory tracts from bacterial invasion

thymus--which is located superiorly in the chest between the aorta and the sternum. Lymphocytes and antibodies are produced in the thymus.

spleen--which is located in the left hypochondriac region. The spleen serves as a blood reservoir, produces antibodies, produces blood cells, and destroys worn-out red blood cells and platelets by phagocytosis.

12. a. phlebitis
b. hemorrhage
c. murmur
d. coronary occlusion
e. arteriosclerosis
f. endocarditis
g. embolus
h. gangrene
i. varicose veins
j. ischemia
k. hypertension
l. atherosclerosis
m. coronary thrombosis
n. anemia
o. angina pectoris
p. rheumatic fever
q. aneurysm
r. pericarditis
s. thrombus

13. Evaluated to the satisfaction of the instructor.

14. Evaluated to the satisfaction of the instructor.

15. Evaluated to the satisfaction of the instructor.

16. Evaluated to the satisfaction of the instructor.

12. Complete the following statements using the diseases and disorders of the circulatory system listed below.

anemia
aneurysm
angina pectoris
arteriosclerosis
atherosclerosis
coronary occlusion
coronary thrombosis
embolus
endocarditis
gangrene
hemorrhage
hypertension
ischemia
murmur
pericarditis
phlebitis
rheumatic fever
thrombus
varicose veins

A. Inflammation of a vein ____________________ 1.

B. Copius bleeding ____________________ 2.

C. Abnormal heart sound ____________________ 3.

D. Closing off of a coronary artery ____________________ 4.

E. Thickening, hardening, and loss of elasticity of walls of blood vessels, especially arteries ____________________ 5.

F. Inflammation of the lining of the heart ____________________ 6.

G. A blood clot or foreign material carried by the blood stream into a small vessel causing its obstruction ____________________ 7.

H. Death of tissue due to lack of blood supply, usually accompanied by bacterial invasion ____________________ 8.

I. Dilatation of veins, usually in lower extremities ____________________ 9.

J. Insufficient blood supply to a given part of the body ____________________ 10.

K. High blood pressure ____________________ 11.

L. A disorder of the lining

of the arteries in which fat is deposited forming plaques that diminish the width of the vessel ______________________ 12.

M. Closing of the coronary artery by a blood clot ______________________ 13.

N. General condition in which the blood is deficient in the number of red blood cells or in hemoglobin ______________________ 14.

O. Severe chest pain ______________________ 15.

P. Disease in which the joints and the heart may become involved as a result of streptococcal infection ______________________ 16.

Q. Abnormal dilatation of the blood vessels ______________________ 17.

R. Inflammation of the pericardium ______________________ 18.

S. Blood clot ______________________ 19.

13. Answer questions about compatibility of ABO blood groups.

14. Label the parts of the diagram of the heart.

15. Trace the course of the blood through the heart.

16. Identify names of diseases and disorders of the circulatory system in puzzle.

NOTE: (If activities #13 - #16 have not been completed prior to the test, ask your instructor when they should be completed.)

UNIT V

THE RESPIRATORY SYSTEM

UNIT OBJECTIVE

After completing this unit, the student will be able to identify terms and names of diseases of the respiratory system. The student will also be able to locate and give the function of the parts of the respiratory system, and to relate the concept of diffusion to actual gas exchange. The student will explain the mechanics and control of respiration. This knowledge will be evidenced through demonstration and by satisfactory completion of a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Match terms to definitions
2. List the parts of the respiratory system and give their location and function
3. Identify terms pertaining to types of abnormal breathing
4. Explain the mechanics of breathing
5. Discuss the control respiration
6. Explain the mechanism of oxygen and carbon dioxide exchange
7. Identify respiratory diseases
8. Label a diagram of parts of respiratory system
9. Label diagram of diffusion of gases
10. Complete outline of functions of some respiratory parts
11. Determine the relationships between carbon dioxide content of the blood and the rate and depth of respiration

UNIT V

THE RESPIRATORY SYSTEM

SUGGESTED ACTIVITIES

I. Instructor

  A. Provide objective sheet

  B. Discuss objective sheet

  C. Pass out information sheet

  D. Discuss information sheet

  E. Make and show transparencies

  F. Distribute and discuss assignment sheets

  G. Use model of human torso to point out parts of the respiratory system

  H. Give test and evaluate results

II. Student

  A. Read objective sheet

  B. Discuss objective sheet

  C. Read information sheet

  D. Discuss information sheet

  E. Complete assignment sheets

  F. Observe or participate in demonstration of parts of respiratory system using model

  G. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheet

C. Transparency masters

  1. V-TM-1--Parts of Respiratory System

  2. V-TM-2--Diffusion of gases

D. Assignment sheets

  1. Assignment Sheet #1--Diagram of Parts of Respiratory System

  2. Assignment Sheet #2--Diagram of Diffusion of Gases

  3. Assignment Sheet #3--Outline of Function of Some Respiratory Parts

  4. Assignment Sheet #4--Relationship Between Carbon Dioxide Content of Blood and Rate and Depth of Respiration

E. Answers to assignment sheets

F. Test

G. Answers to test

II. References

A. Books

1. Anderson, Paul D. Clinical Anatomy and Physiology for Allied Health Sciences. Philadelphia, Pennsylvania: W.B. Saunders, 1976.

2. Anthony, Catherine Parker, and Irene B. Alyn. Structure and Function of the Body. 5th ed. St. Louis, Missouri: C.V. Mosby Company, 1976.

3. Jacob, Stanley W., and Clarice Ashworth Francone. Structure and Function in Man. 3rd ed. Philadelphia, Pennsylvania: W.B. Saunders Company, 1974.

4. Memmler, Ruth Lundeen, and Dena Lin Wood. The Human Body in Health and Disease. 4th ed. Philadelphia, Pennsylvania: J.B. Lippincott Company, 1977.

UNIT V

THE RESPIRATORY SYSTEM

INFORMATION SHEET

I. Terms and definitions

   A. Breathing--inhaling and exhaling air

   B. Cellular respiration--union of oxygen and digested food in the cell with the release of energy

   C. Cyanosis--bluish color of skin caused by oxygen deficiency in the blood

   D. Diffusion--moving of molecules from a region of higher concentration to a region of lower concentration of molecules

   E. Epistaxis--nose bleed

   F. Eupnea--normal respiration

   G. Exhalation--expulsion of air from alveoli of lungs

   H. External respiration--exchange of oxygen and carbon dioxide in the lungs

   I. Inhalation--phase during which air is drawn into the lungs

   J. Internal respiration--exchange of carbon dioxide and oxygen in body cells

II. Organs of respiration

   A. Nose (nostrils)--air enters respiratory system through nostrils

      1. Filter air by means of hairs in nostrils

      2. Trap bacteria and debris on mucosal surface

      3. Warm air prior to entry into pharynx

   B. Paranasal sinuses--cavities in bones of skull which open into the nasal cavity

1. Reduce overall weight of skull
2. Provide mucus for nasal cavity
3. Enhance resonance of voice

C. Pharynx--extends from mouth to esophagus

1. Provides passageway for food and air
2. Aids in forming vowel sounds

D. Larynx--at upper end of trachea just below the pharynx

1. Protects airway from entrance of solids or liquids during swallowing
2. Contains vocal cords which function in speech production
    a. Glottis--opening into larynx
    b. Epiglottis--structure that covers the glottis during swallowing and thus prevents food or liquid from entering the airway

E. Trachea--tube 4 1/2 inches long extending from larynx to bronchi

1. "C"-shaped cartilage rings provide firmness to soft tissue of trachea and thus prevent collapse of airway
2. Provides passageway for inhaled and exhaled air

F. Bronchi--trachea divides at lower end to form bronchi, which lead from trachea to each lung

1. Bronchi branch to form secondary bonchi
2. Bronchioles are branches of secondary bronchi
3. Alveolar ducts are branches of bronchioles which lead to alveoli

G. Lungs--pair of lobed organs in chest cavity, extending from diaphragm to clavicle

1. Alveoli--tiny air sacs that actually make up the lungs

2. Actual exchange of oxygen and carbon dioxide takes place through the walls of the alveoli

H. Diaphragm

1. Separates abdominal and chest cavities

2. Contraction of the diaphragm causes air to enter the lungs

I. Pleura--Serous membrane that covers the lungs and also lines the chest cavity

III. Types of abnormal respiration

A. Hyperpnea--abnormally increased breathing

B. Apnea--cessation of breathing

C. Cheyne-Stokes respiration--respirations gradually increase in rapidity and volume until they reach climax, then gradually subside, cease entirely for a few seconds, then begin cycle again

D. Anoxia--lack of oxygen

E. Asphyxia--an oxygen deficiency with a resulting increase of carbon dioxide in the tissues

IV. Mechanics of respiration

A. Diaphragm and intercostal muscles contract enlarging chest cavity; air rushes in to fill lungs

B. Diaphragm and intercostal muscles relax; air is pushed out of lungs by the elastic recoil of chest and lungs

V. Control of respiration

A. Medulla and pons of brain control inhalation and expiration

B. Increased carbon dioxide level in the blood stimulates breathing

C. Increased ventilation permits loss of carbon dioxide from the blood and decrease in rate of breathing

D. Other factors that may be involved in control of respiration are age, sensory stimuli, blood pressure, or shock.

VI. Mechanism of oxygen and carbon dioxide exchange

A. Diffusion is the movement of molecules from region of higher concentration to a region of lower concentration of molecules.

B. Oxygen enters the alveoli of the lung as air is brought in by inhalation. Thus the concentration of oxygen in the alveoli is greater than in the blood in the surrounding capillaries.

C. Oxygen moves from the alveoli to the blood in the capillaries through alveolar and capillary walls. The oxygenated blood moves through the body by means of the arterial system.

D. If the oxygen concentration in the blood is greater than the oxygen concentration in the cells, oxygen molecules move from blood to body cells.

E. Cellular respiration is the combination of oxygen with digested food with the release of energy. Carbon dioxide and water are given off as waste. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O \uparrow$

F. Carbon dioxide produced in cellular respiration diffuses from cells to venous blood, returns to alveoli, and is exhaled.

G. The purpose of external and internal respiration is to provide oxygen for cellular respiration and a means of disposal of waste carbon dioxide.

VII. Diseases and disorders of respiratory system

A. Asthma--allergic reaction characterized by localized swelling in walls of small bronchioles with secretion of thick mucus and spasm of the smooth muscle walls of the bonchioles

B. Atelectasis--collapse of part or all of a lung with incomplete expansion of the alveoli.

C. Bronchiectasis--dilation of bronchi with cough, voluminous sputum, and labored respiration on exertion.

D. Cancer of lung--factors most frequently mentioned as possible causes are the presence of foreign particles and irritants in the air and smoking cigarettes and cigars

E. Common cold--most widespread of all communicable diseases, characterized by swollen and inflamed mucous membrane of nose and throat with copious discharge

F. Cough--mechanism for clearing obstructions from airway

G. Emphysema--distention of alveoli due to chronic bronchial obstruction

H. Epistaxis--nose bleed

I. Hay fever--sensitivity to foreign proteins causing watery discharge from eyes and nose

J. Influenza--acute, contagious disease characterized by inflammation of the upper respiratory tract and generalized aches and pains

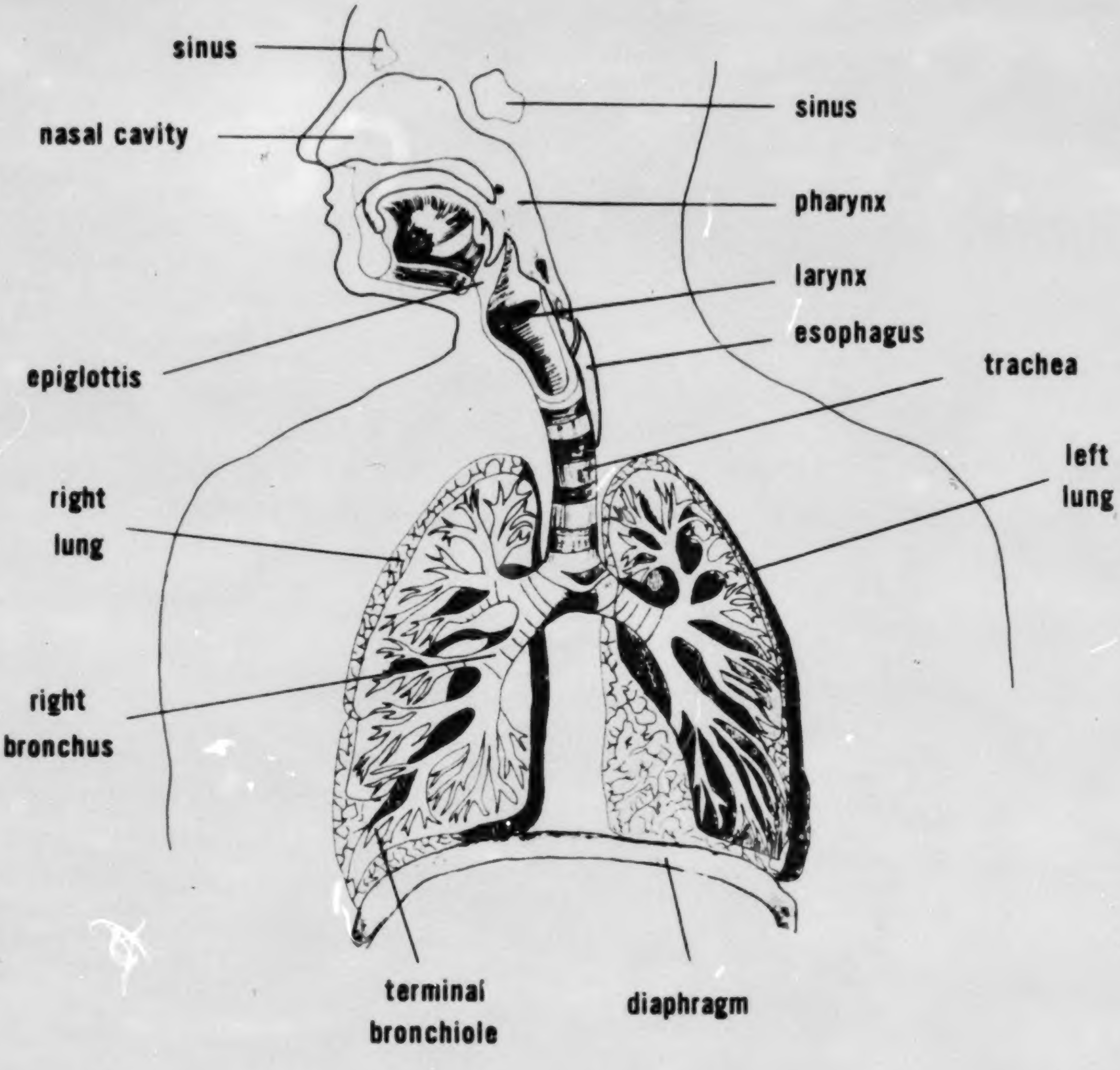
K. Pleurisy--inflammation of the pleura, usually accompanies infections of the lung

L. Pneumonia--inflammation of the alveoli of the lung, may be caused by bacteria or viruses

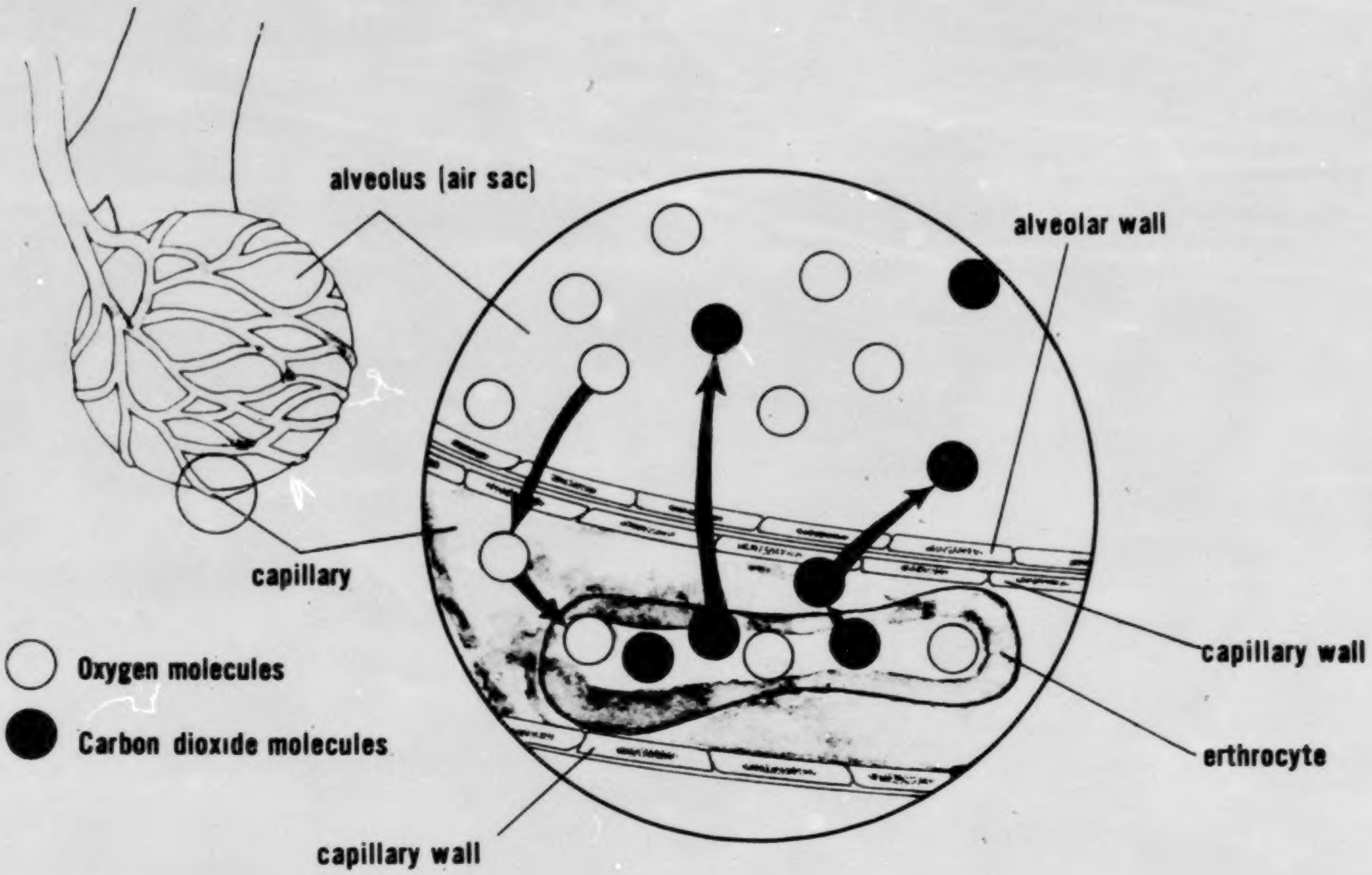
M. Sinusitis--inflammation of a sinus

N. Tuberculosis--inflammation of lungs and pleurae, caused by bacterium. (Occasionally invades other parts of the body)

PARTS OF THE RESPIRATORY SYSTEM


sinus
nasal cavity
sinus
pharynx
larynx
esophagus
epiglottis
trachea
left lung
right lung
right bronchus
terminal bronchiole
diaphragm

DIFFUSION OF GASES


alveolus (air sac)
alveolar wall
capillary
capillary wall
erthrocyte
capillary wall
Oxygen molecules
Carbon dioxide molecules

V-TM-2

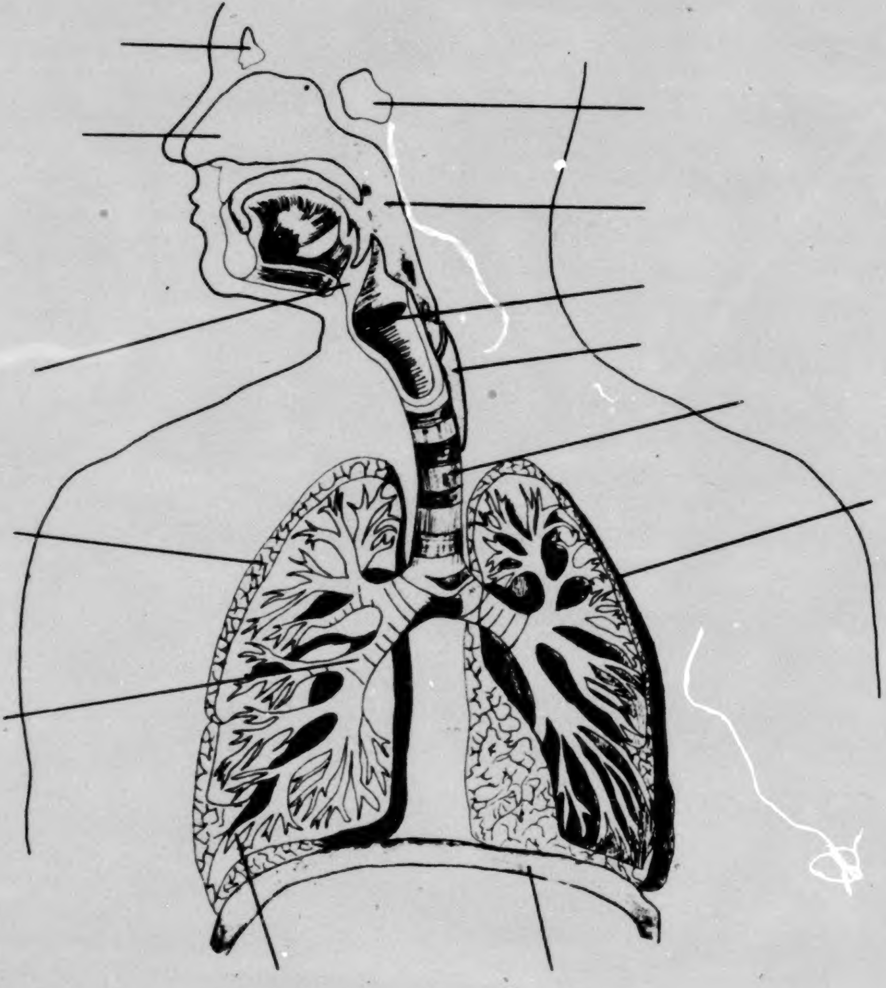
UNIT V

THE RESPIRATORY SYSTEM

ASSIGNMENT SHEET #1--DIAGRAM OF PARTS OF RESPIRATORY SYSTEM

Directions: Label the following parts of the respiratory system.

- sinus
- pharynx
- nasal cavity
- epiglottis
- larynx
- esophagus
- trachea
- left lung
- right lung
- right bronchus
- diaphragm



UNIT V

THE RESPIRATORY SYSTEM

ASSIGNMENT SHEET #2--DIAGRAM OF DIFFUSION OF GASES

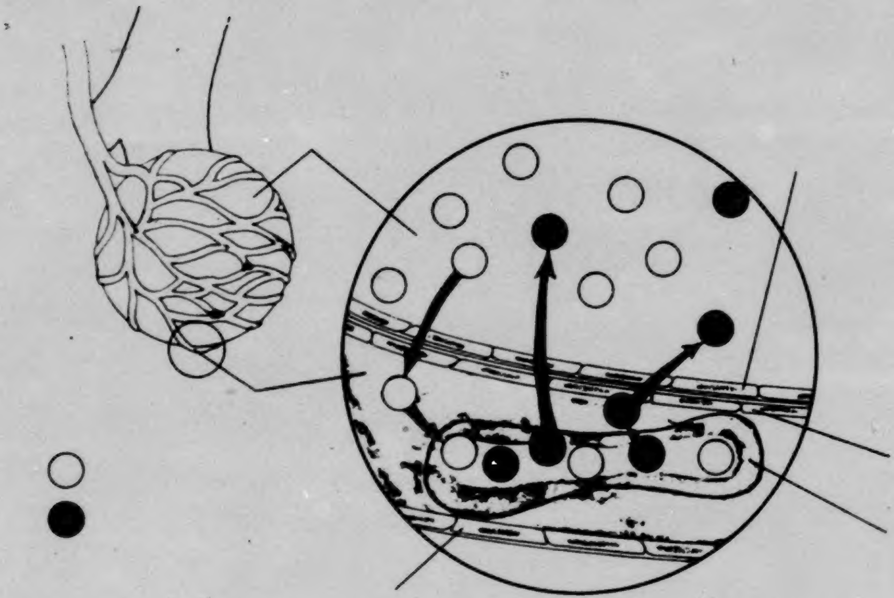
Directions: Label the following parts of the diagram of diffusion of gases:

capillary wall	oxygen molecules
capillary	carbon dioxide molecules
alveolus	erythrocyte

Label the following parts of the enlarged section of the lung:

alveolar duct
alveolus
alveolar sac

DIFFUSION OF GASES



UNIT V

THE RESPIRATORY SYSTEM

ASSIGNMENT SHEET #3--FUNCTION OF SOME RESPIRATORY PARTS

Directions: Complete the following outline.

1. Nostrils
   A. Filter air by means of hairs in nostrils
   B.
   C.
2. Sinuses
   A. Enhance resonance of voice
   B.
   C.
3. Pharynx
   A. Passageway for food and air
   B.
4. Larynx
   A. Contains vocal cords which function in speech production
   B.

UNIT V

THE RESPIRATORY SYSTEM

ASSIGNMENT SHEET #4--RELATIONSHIP BETWEEN CARBON DIOXIDE CONTENT OF BLOOD AND RATE AND DEPTH OF RESPIRATION

Directions: You will need a watch with a second-hand and a paper bag. You will work in pairs.

1. As your partner sits quietly, count respiration for one minute and note depth. Record rate and depth (normal, deep, shallow).

   ________ Rate
   ________ Depth

2. Have partner hyperventilate by breathing deeply and rapidly for two minutes. Immediately count respirations and note depth for one minute.

   ________ Rate
   ________ Depth

3. Have partner rest until normal breathing is resumed.

4. Have partner hyperventilate for two minutes into a paper bag held tightly over nose and mouth. Immediately count respirations for one minute and note depth.

   ________ Rate
   ________ Depth

CONCLUSIONS:

1. Does hyperventilation increase or decrease blood CO_2 content? ____________

2. From your results in step 2 did you find that the decrease in carbon dioxide was followed by an increase or decrease in rate and depth of respirations? ____________

3. Does hyperventilation into the paper bag cause an increase or decrease of carbon dioxide content?

   ____

4. Does an increase in blood carbon dioxide cause an increase or decrease in respiration rate?

   ____

5. Normally, when blood carbon dioxide content increases, do respirations increase or decrease?

____

UNIT V

THE RESPIRATORY SYSTEM

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1--Labeled diagram

Assignment Sheet #2--Labeled diagram

Assignment Sheet #3--

1. B. Moist mucosal lining traps bacteria and debris

   C. Warm air prior to entry into pharynx

2. B. Reduce overall weight of skull

   C. Provide mucus for nasal cavity

3. B. Aids in forming vowel sounds

4. B. Protects airway against entrance of solids or liquids during swallowing

Assignment Sheet #4

1. Decrease

2. Rate decreased
   Deep respiration

3. Increase

4. Increase

5. Increase

UNIT V

THE RESPIRATORY SYSTEM

UNIT TEST

1. Match the terms relating to the respiratory system on the right to the correct definition using number answers.

_____ a. Nose bleed

_____ b. Normal respiration

_____ c. The exchange of carbon dioxide and oxygen in the lungs

_____ d. Bluish color of skin caused by oxygen deficiency in the blood

_____ e. The moving of molecules from a region of higher concentration to a region of lower concentration of molecules

_____ f. The phase during which air is drawn into the lungs

_____ g. The exchange of carbon dioxide and oxygen in the body cells

_____ h. The expulsion of air from the alveoli of the lungs

_____ i. The union of oxygen with digested food in the cells with the release of energy; carbon dioxide and water are released as water

_____ j. Inhaling and exhaling air

1. breathing
2. cellular respiration
3. cyanosis
4. diffusion
5. epistaxis
6. eupnea
7. exhalation
8. external respiration
9. inhalation
10. internal respiration

2. List the parts of the respiratory system and give their location and function.

3. Identify the terms pertaining to types of abnormal breathing by completing the following statements.

   A. A lack of oxygen is ________________________.

   B. An oxygen deficiency with a resulting increase in carbon dioxide in the tissues is_________________.

   C. Abnormally increased breathing is________________.

   D. Respirations gradually increase in rapidity and volume until they reach a climax; then gradually subside, cease entirely for a few seconds, then begin again in _____________________ respiration.

   E. The cessation of breathing is___________________.

4. Explain the mechanics of breathing.

5. Discuss the factors that control respiration.

6. Explain the mechanism of carbon dioxide and oxygen exchange by answering the following questions:

   A. What is diffusion? ______________________________
   ____

   B. After inhalation, is the concentration of oxygen in the alveoli greater or lesser than that of the surrounding capillaries? ___________________________

   C. Oxygen from the alveoli moves through the alveolar wall and the capillary wall by the process of
   ____.

   D. If the oxygen concentration in the blood is greater than the oxygen concentration in the cells, oxygen molecules move into or out of the blood?___________

   E. The combination of oxygen with digested food with the release of energy is_________________________.

   F. What becomes of the carbon dioxide produced in cellular respiration after it returns to the alveoli?____

   G. What is the overall purpose of external and internal respiration? _______________________________
   ____
   ____

7. Identify the following diseases and disorders of the respiratory system by answering the following questions. Choose the correct word from those listed after each of the following statements.

   A. Allergic reaction, characterized by localized swelling in the walls of the small bronchioles, with secretion of thick mucus and spasm of the smooth muscle walls of the bronchioles. (asthma), (common cold), (epistaxis), (pleurisy) ____________________.

   B. Inflammation of lungs and pleurae, caused by a bacterium. (Occasionally invades other parts of the body.) (sinusitis), (cancer of the lung), (bronchiectasis), (tuberculosis) ____________________

   C. Collapse of part or all of a lung with incomplete expansion of the alveoli. (pleurisy), (common cold), (sinusitis), (atelectasis) ____________________

   D. Inflammation of a sinus. (tuberculosis), (cough), (epistaxis), (sinusitis) ____________________

   E. Dilation of bronchi with cough, voluminous sputum, and labored respiration on exertion. (pleurisy), (bronchiectasis), (common cold), (epistaxis)

      ____

   F. Inflammation of the alveoli of the lung; maybe caused by bacterium or virus. (pleurisy), (pneumonia), (atelectasis), (sinusitis)

      ____

   G. Factors most frequently mentioned as possible causes of this disease are: the presence of foreign particles and irritants in the air, and smoking cigarettes and cigars. (bronchiectasis), (common cold), (cancer of the lung), (asthma)

      ____

   H. Inflammation of the pleura, usually accompanies infections of the lung. (pneumonia), (pleurisy), (influenza), (asthma) ____________________

   I. Most widespread of all communicable diseases, characterized by swollen and inflamed mucous membrane of the nose and throat with copious discharge. (common cold), (atelectasis), (cancer of the lung), (sinusitis) ____________________

J. Acute, contagious disease, characterized by inflammation of the upper respiratory tract and generalized aches and pains. (epistaxis), (pleurisy), (influenza), (asthma) ________________

K. Mechanism for clearing obstruction from airway. (atelectasis), (bronchiectasis), (cough), (hay fever) ________________

L. Sensitivity to foreign proteins causing watery discharge from eyes and nose. (hay fever), (peneumonia), (cancer of the lung), (emphysema)

____

M. Distention of alveoli due to bronchial obstruction. (cough), (epistaxis), (cancer of the lung), (emphysema) ________________

N. Nose bleed. (epistaxis), (common cold), (atelectasis), (influenza) ________________

8. Label a diagram of the parts of the respiratory system.

9. Label a diagram of diffusion of gases.

10. Complete an outline of functions of some respiratory parts.

11. Determine the relationship between carbon dioxide content of the blood and the rate and depth of respiration.

(Note: If activities #8 - #11 have not been completed prior to the test, ask the instructor when they should be completed.)

UNIT V

THE RESPIRATORY SYSTEM

ANSWERS TO UNIT TEST

1. 5 a.
   6 b.
   8 c.
   3 d.
   4 e.
   9 f.
   10 g.
   7 h.
   2 i.
   1 j.

2. A. Nose (nostrils)--air enters respiratory system through nostrils
      1) Filter air by means of hair in nostrils
      2) Trap bacteria and debris on mucosal surface
      3) Warm air prior to entry into pharynx
   B. Paranasal sinuses--cavities in bones of skull which open into the nasal cavity
      1) Reduce overall weight of skull
      2) Provide mucus for nasal cavity
      3) Enhance resonance of voice
   C. Pharynx--extends from mouth to esophagus
      1) Provides passageway for food and air
      2) Aids in forming vowel sounds

D. Larynx--at upper end of trachea just below the pharynx

   1) Protects airway from entrance of solids or liquids during swallowing

   2) Contains vocal cords which function in speech production

      a. Glottis--opening into the larynx

      b. Epiglottis--covers the glottis during swallowing and thus prevents food or liquid from entering the airway.

E. Trachea--extends from larynx to bronchi

   1) "C"-shaped cartilage rings provide firmness to soft tissue of trachea and thus prevent collapse of airway

   2) Provides passageway for inhaled and exhaled air

F. Bronchi--lead from trachea to each lung

   1) Bronchi branch to form secondary bronchi

   2) Bronchioles are branches of secondary bronchi

   3) Alveolar ducts are branches of bronchioles which lead to alveoli

G. Lungs--pair of lobed organs in chest cavity; extend from diaphragm to clavicle

   1) Alveoli--tiny air sacs that actually make up the lungs

   2) Actual exchange of oxygen and carbon dioxide takes place through the walls of the alveoli

H. Diaphragm

   1) Separates abdominal and chest cavities

   2) Contraction of diaphragm causes air to enter lungs

I. Pleura--serous membrane that covers the lungs and lines chest cavity

3. A. anoxia

   B. asphyxia

   C. hyperpnea

   D. Cheyne-Stokes

   E. apnea

4. A. Diaphragm and intercostal muscles contract enlarging chest cavity; air rushes in to fill lungs

   B. Diaphragm and intercostal muscles relax; air is pushed out of lungs by the elastic recoil of chest and lungs

5. A. Medulla and pons of brain control inhalation and expiration

   B. Increased carbon dioxide level in the blood stimulates breathing

   C. Increased ventilation permits loss of carbon dioxide from blood and decrease in rate of breathing

   D. Other factors that may be involved in the control of respiration are age, sensory stimuli, blood pressure, or shock

6. A. Diffusion is the movement of molecules from a region of higher concentration to a region of lower concentration of molecules

   B. greater

   C. diffusion

   D. out of

   E. cellular respiration

   F. exhaled

   G. provide oxygen for cellular respiration

7. A. asthma

   B. tuberculosis

   C. atelectasis

D. sinusitis

E. bronchiectasis

F. pneumonia

G. cancer of lung

H. pleurisy

I. common cold

J. influenza

K. cough

L. hay fever

M. emphysema

N. epistaxis

8. Evaluated to the satisfaction of the instructor .

9. Evaluated to the satisfaction of the instructor

10. Evaluated to the satisfaction of the instructor

11. Evaluated to the satisfaction of the instructor

UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

UNIT OBJECTIVE

After completion of this unit, the student will be able to identify parts of the nervous system and special senses and give their general functions. This knowledge will be evidenced through demonstration and by satisfactory completion of a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Identify the three divisions of the nervous system
2. List and identify the main divisions of the brain
3. Cite two functions of the spinal cord
4. List and describe the three protective layers of the spinal cord
5. Discuss the function of the cerebrospinal fluid
6. Identify the divisions of the peripheral nervous system
7. Explain the control of involuntary functions of the body by the sympathetic and parasympathetic nervous systems
8. Identify terms pertinent to the structure, function, and types of neurons and neuroglia
9. Trace the path of impulses as they travel along a reflex arc
10. Point out the parts of the eye and discuss the physiology of vision
11. Point out the parts of the ear and discuss the physiology of hearing

12. List five general senses

13. Recognize diseases and disorders of the nervous system and special senses from definitions

14. Label a diagram of the brain

15. Label a diagram of a neuron

16. Test reflexes and determine referred pain

17. Label a diagram of the eye

18. Label a diagram of the ear

19. In a puzzle, identify names of diseases and disorders of the nervous system and special senses

UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide objective sheet

  B. Discuss objective sheet

  C. Pass out information sheet

  D. Discuss information sheet

  E. Make and show transparencies

  F. Distribute and discuss assignment sheets

  G. Use models of brain, eye and ear and to point out parts

  H. Give test and evaluate results

II. Student:

  A. Read and discuss objective sheet

  B. Read and discuss material contained in information sheet

  C. Complete assignment sheets

  D. Observe or participate in demonstration of parts of brain, eye and ear using models or diagrams

  E. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheet

  C. Transparency masters

1. VI-TM-1--Diagram of parts of brain
2. VI-TM-2--Diagram of a neuron
3. VI-TM-3--Diagram of eye
4. VI-TM-4--Diagram of ear

D. Assignment sheets

1. Assignment sheet #1 -- Diagram of the brain
2. Assignment sheet #2 -- Diagram of a neuron
3. Assignment sheet #3 -- Testing reflexes and determination of referred pain
4. Assignment sheet #4 -- Diagram of the eye
5. Assignment sheet #5 -- Diagram of the ear
6. Assignment sheet #6 -- Word find puzzle

E. Answers to assignment sheets

F. Test

G. Answers to test

II. References: Books

A. Anderson, Paul D. Clinical Anatomy and Physiology for Allied Health Sciences. Philadelphia, Pennsylvania: W.B. Saunders, 1976.

B. Anthony, Catherine Parker and Irene B. Alyn. Structure and Function of the Body. 5th ed. St. Louis, Missouri: C.V. Mosby Company, 1976.

C. Anthony, Catherine Parker and Norma Jane Kolthoff. Textbook of Anatomy and Physiology. 9th ed. St. Louis, Missouri: C.V. Mosby Company, 1975.

D. Jacob, Stanley W. and Clarice Ashworth Francone. Structure and Function in Man. 3rd ed. Philadelphia, Pennsylvania: W.B. Saunders Company, 1974.

E. Memmler, Ruth Lundeen and Dena Lin Wood. The Human Body in Health and Disease. 4th ed. Philadelphia, Pennsylvania: J.B. Lippincott Company, 1977.

UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

INFORMATION SHEET

I. Divisions of the nervous system

   A. Central nervous system, consisting of the brain and spinal cord

   B. Peripheral nervous system, consisting of nerves extending to outlying parts of the body

   C. Autonomic nervous system, which controls involuntary functions of the body

II. Brain parts and functions

   A. Cerebrum--largest part of brain, divided into two cerebral hemispheres. The hemispheres are divided into lobes.

      1. Frontal lobe--controls voluntary muscles

      2. Parietal lobe--contains sensory areas; pain, touch, and temperature are integrated here.

      3. Temporal lobe--auditory center, interprets impulses from ear drum

      4. Occipital lobe--visual center, interprets impulses from retina of eye

   B. Cerebellum--composed of two lateral hemispheres and mid-portion. It is dorsal to the pons and medulla oblongata.

      1. Makes possible the production of smooth, coordinated movements

      2. Center for control of equilibrium and posture

   C. Pons--rounded eminence on ventral surface of brain stem; appears as a broad band of transverse fibers. The pons is the part of the brain that attaches to the spinal cord

      1. Transmits messages from one side of the cerebellum to the other

2. Transmits messages from cerebellum to cerebrum and midbrain, and from cerebellum to medulla and spinal cord

3. Connects with four pairs of cranial nerves

4. Controls some reflex actions, as respiration

D. Medulla oblongata--continuous with spinal cord posteriorly and with pons anteriorly.

1. Relay station for passage of impulses between spinal cord and brain

2. Contains control centers for respiration, heartbeat and blood pressure. Death follows quickly if these centers fail to function

III. Spinal cord--lies within spinal canal, extends from medulla to 1st lumbar vertebra

A. Contains centers for reflex action

B. Serves as two-way conduction pathway between brain and nerves

IV. Meninges--layers of connective tissue that surround, enclose, and protect the brain and spinal cord

A. Dura mater--layer of strong white fibrous tissue; serves as outer layer of meninges and inner periosteum of cranial bones

B. Arachnoid membrane--middle layer of meninges; delicate cobweb-like tissue that allows space for fluids

C. Pia mater--inner layer; attaches to nerve tissue of brain and spinal cord. The pia mater contains blood vessels and dips into all depressions of the brain.

V. Cerebrospinal fluid--formed continuously from the blood, circulates around the brain and spinal cord; returns to blood. The cerebrospinal fluid serves as a protective cushion around and within the spinal cord

VI. Peripheral nervous system--composed of nerves that extend to outlying parts of the body

A. Cranial nerves--

1. Twelve pairs of symmetrically-arranged nerves that attach to brain

2. Conduct impulses between brain and various structures in head, neck, thoracic, and abdominal cavities

B. Spinal nerves

1. The 31 pairs of symetrically-arranged nerves attached to spinal cord

2. Conduct impulses between the spinal cord and parts of the body not supplied by cranial nerves

VII. Autonomic nervous system--controls the involuntary or automatic functions of the body, as the action of glands, the smooth muscles of hollow organs, and the heart

A. Sympathetic nervous system--prepares body for stressful situations as in fear, anger, pain

B. Parasympathetic nervous system--acts as balance for the sympathetic system--brings about return to normal activity of the autonomic nervous system.

VIII. Cells of the nervous system

A. Neuron--nerve cell body and its extensions, transmits impulses

1. Structure of a neuron

a. Cell body

b. Dendrites--projections that transmit impulses to the nerve cell body

c. Axon--projection that transmits impulses away from the nerve cell body

d. Neurilemma--thin membranous sheath enveloping a peripheral nerve fiber. The neurilemma plays an important role in the regeneration of peripheral nerves.

e. Myelin sheath--fat-like substance forming a protective wrapping around nerve fibers

2. Types of neurons

    a. Sensory (afferent) neuron--transmits impulses to spinal cord or brain

    b. Motor (efferent) neuron--transmits impulses away from the brain or spinal cord to muscles or glands

    c. Interneuron (central or connecting neuron)--conducts impulses from sensory to motor neurons

B. Neuroglia--connective tissue cells that function in supportive, reparative and metabolic capacities

    1. Astrocytes--characterized by threadlike branches which attach to both nerves and small blood vessels. Astrocytes hold small blood vessels close to each other

    2. Microglia--minute neuroglia that move about in inflamed brain tissue and phagocytize microbes

IX Reflex arc

A. Definitions

    1. Receptor--beginning of a dendrite of a sensory neuron

    2. Synapse--microscopic space between the axon endings of one neuron and the dendrites of another

    3. Effector--muscles or glands that respond to stimulation

    4. Reflex--the response to impulse conduction over a reflex arc

B. Path of an impulse

    1. Impulses travel from a receptor, the full length of the sensory neuron's dendrite, through the nerve cell body and axon to the branching, brushlike ends of the axon.

    2. The impulse crosses the synapse between the axon of a neuron, and the dendrites of a second neuron.

   3. After crossing the synapse, the impulse continues along the dendrite of the second neuron until the axon of a motor neuron reaches an effector

   4. The effector, a muscle or a gland, responds to stimulation; thus a reflex action occurs

X. Structure and function of the eye

   A. Parts of eye

      1. Sclera--outer, tough, white tissue which gives shape to and protects the eyeball

      2. Cornea--transparent, colorless, continuation of the sclera through which light rays enter the eye

      3. Choroid--middle layer of the eye which supplies blood to other parts of eye

      4. Iris--forward extension of choroid layer, colored part of eye

      5. Pupil--opening at center of iris which allows light to enter eye

      6. Ciliary body--a muscle which supports and modifies the shape of the lens

      7. Retina--third and innermost layer of eye, translates light waves into nerve impulses

         a. Rods--sensitive to dim light, function in night vision

         b. Cones--receptors responsible for detailed vision and color

      8. Refracting media of eye

         a. Aqueous humor--fluid that fills portion of eye in front of lens

         b. Vitreous body--gelatinous fluid that fills the portion of the eye behind the lens

         c. Lens--biconcave, crystalline body that constantly adjusts in thickness to focus light rays

9. Accessory organs
    a. Eyebrows and eyelashes--protect against entry of foreign objects into the eyes
    b. Conjunctiva--tissue that lines eyelid and is continuous with surface cells at the margin of the cornea
    c. Eyelids--folds of tissue that cover and protect the eye
    d. Lacrimal apparatus--produces tears that constantly moisten and cleanse eyes

B. Physiology of vision
    1. Light rays enter eye through cornea
    2. Lens changes thickness to focus rays on retina
    3. Retina translates light energy into nerve impulses
    4. Nerve impulses are conducted to visual center of cerebrum

XI. Structure and function of the ear
- A. External parts of ear
    1. Pinna (auricle)--projecting part of ear
    2. Auditory canal (meatus)--canal which extends to the middle ear
- B. Middle ear
    1. Tympanic membrane (ear drum)
    2. Eustachian tube--tube leading from middle ear cavity to throat; equalizes pressure on ear drum
    3. Ossicles--tiny bones
        a. Malleus (hammer)--attaches to tympanic membrane

      b. Incus (anvil)--attaches to malleus

      c. Stapes (stirrup)--attaches to oval window of inner ear

    4. Oval window--opening between middle ear and inner ear. Covered by membrane

  C. Inner ear (labyrinth)

    1. Vestibule

    2. Cochlea--contains receptors which, when stimulated, transmit nerve impulses to brain

    3. Semicircular canals--concerned with equilibrium

  D. Physiology of hearing

    1. Sound waves enter external auditory canal

    2. Tympanic membrane vibrates, causing ossicles to vibrate

    3. Vibrations are transmitted mechanically from ossicles to oval window

    4. Vibrations of oval window cause pressure waves in liquid of cochlea

    5. Nerve centers in cochlea are stimulated by pressure waves and transmit impulses to hearing center in brain

XII. General senses

  A. Sense of smell (olfactory)

    1. Receptors located in upper part of nasal cavity

    2. Impulses from receptors travel by the olfactory nerve to brain

  B. Taste sense

    1. Taste buds are located on tongue

    2. Four tastes are perceived by taste buds, sweet, sour, salt, and bitter

- C. Pain sense
  1. Receptors widely distributed in body
  2. Pain usually is warning of danger to body
  3. Referred pain--pain seeming to arise in an area other than its actual origin
- D. Other general senses are hunger, thirst, pressure, temperature, position, and touch

XIII. Diseases and disorders of the nervous system and special senses

- A. Anorexia--loss of appetite
- B. Astigmatism--an irregularity of the curvature of the lens on cornea of the eye, resulting in faulty vision
- C. Cerebral palsy--congenital brain disorder, characterized by diverse disorders of muscles varying from weakness to complete paralysis
- D. Chorea--convulsive nervous disease characterized by involuntary jerking movements
- E. Conjunctivitis--inflammation of the conjunctiva of the eye
- F. C.V.A. (cerebrovascular accident)--destruction of brain tissue as a result of hemorrhage from cerebral blood vessels
- G. Encephalitis--infection of the brain
- H. Epilepsy--chronic disorder with abnormality of brain function without apparent changes in nerve tissues. (Falling sickness)
- I. Glaucoma--impaired vision or blindness as a result of excess pressure of eye fluid
- J. Hydrocephalus (water on the brain)--gross enlargement of the cranium and atrophy of the brain due to accumulation of excessive amounts of fluid in and around the brain
- K. Hyperopia--defect in vision in which light rays focus behind the retina (farsightedness)

L. Meningitis--inflammation of the membranes covering the brain and spinal cord

M. Motion sickness--nausea, vomiting, and dizziness induced by irregular or rhythmic movements, as car sickness or seasickness

N. Multiple sclerosis--chronic, slowly progressive disease of the central nervous system due to degeneration of axons

O. Myopia--defect in vision in which light rays focus in front of the retina (Nearsightedness)

P. Neuralgia--severe, sharp pain along the course of a nerve

Q. Otitis media--inflammation of the middle ear

R. Otosclerosis--type of deafness caused by bone changes that prevent normal vibration of the stapes

S. Paralysis--temporary or permanent loss of function, especially loss of sensation or voluntary motion

T. Poliomyelitis--an acute viral disease which affects the brain and spinal cord. The virus may destroy motor nerve cells in the spinal cord, causing paralysis

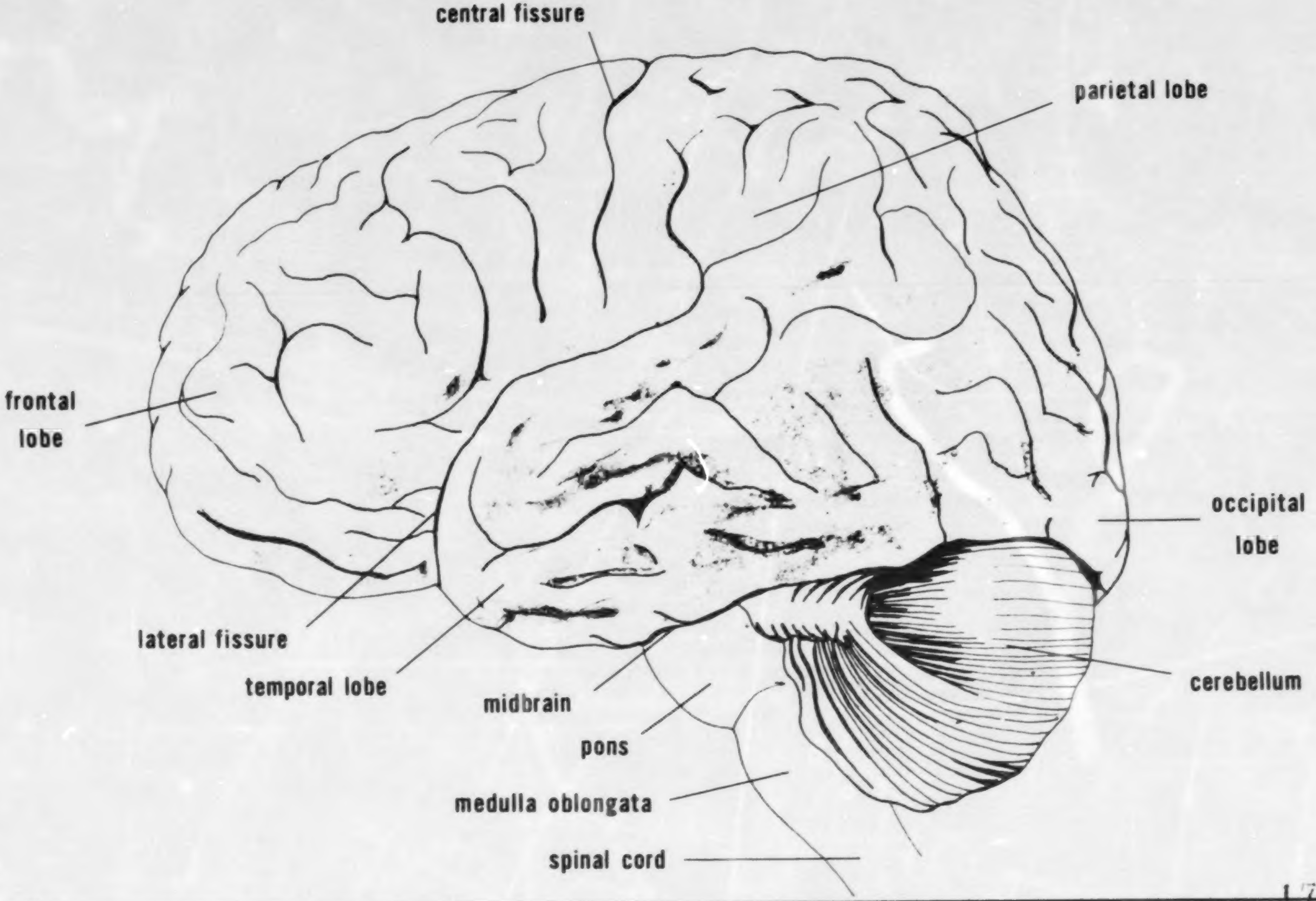
U. Shingles--formation of blisters along the course of a nerve; most frequently the intercostal nerves

V. Strabismus (crossed eyes)--muscles of eyeballs do not coordinate, so the two eyes do not work together

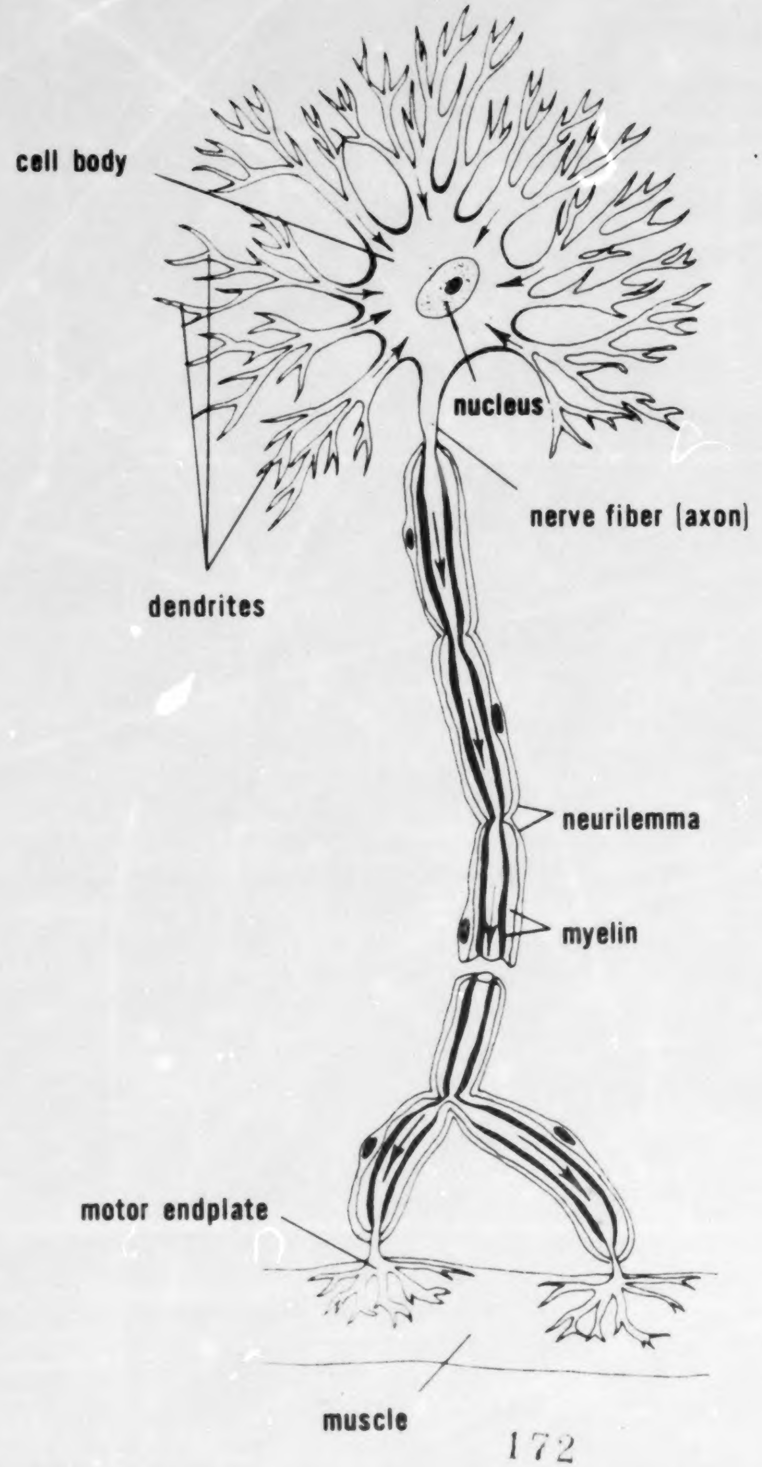
W. Tinnitus--ringing or buzzing sound in ear

X. Vertigo--sense of movement of self or surroundings; dizziness

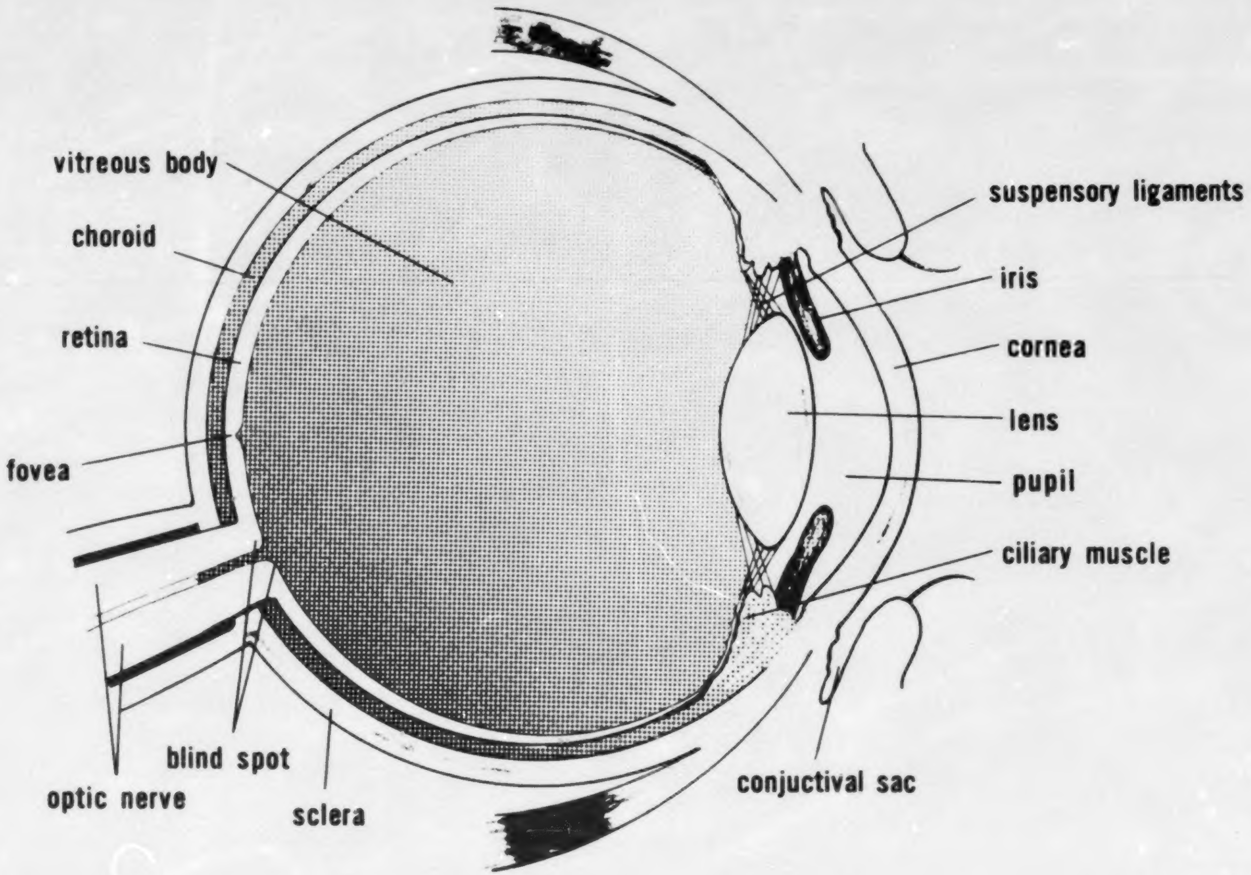
PARTS OF THE BRAIN


central fissure
parietal lobe
frontal lobe
occipital lobe
lateral fissure
temporal lobe
midbrain
cerebellum
pons
medulla oblongata
spinal cord

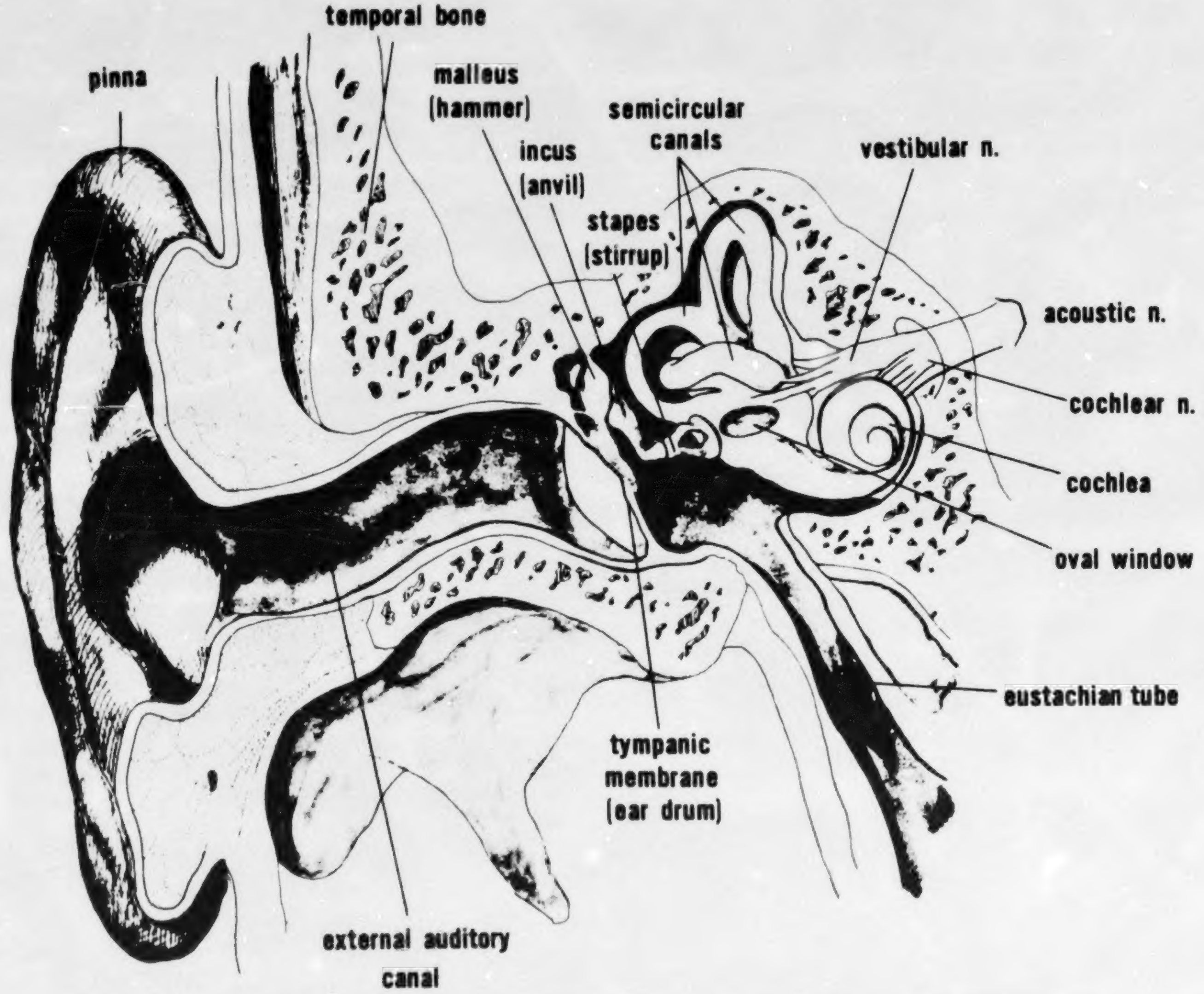
MOTOR NEURON


cell body
dendrites
nucleus
nerve fiber (axon)
neurilemma
myelin
motor endplate
muscle

PARTS OF THE EYE


vitreous body
choroid
retina
fovea
optic nerve
blind spot
sclera
suspensory ligaments
iris
cornea
lens
pupil
ciliary muscle
conjuctival sac

PARTS OF THE EAR


temporal bone
pinna
malleus (hammer)
incus (anvil)
stapes (stirrup)
semicircular canals
vestibular n.
acoustic n.
cochlear n.
cochlea
oval window
eustachian tube
tympanic membrane (ear drum)
external auditory canal

UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

ASSIGNMENT SHEET #1--DIAGRAM OF THE BRAIN

Directions: Label the following parts of the brain on the accompanying diagram:

Frontal lobe

Parietal lobe

Occipital lobe

Temporal lobe

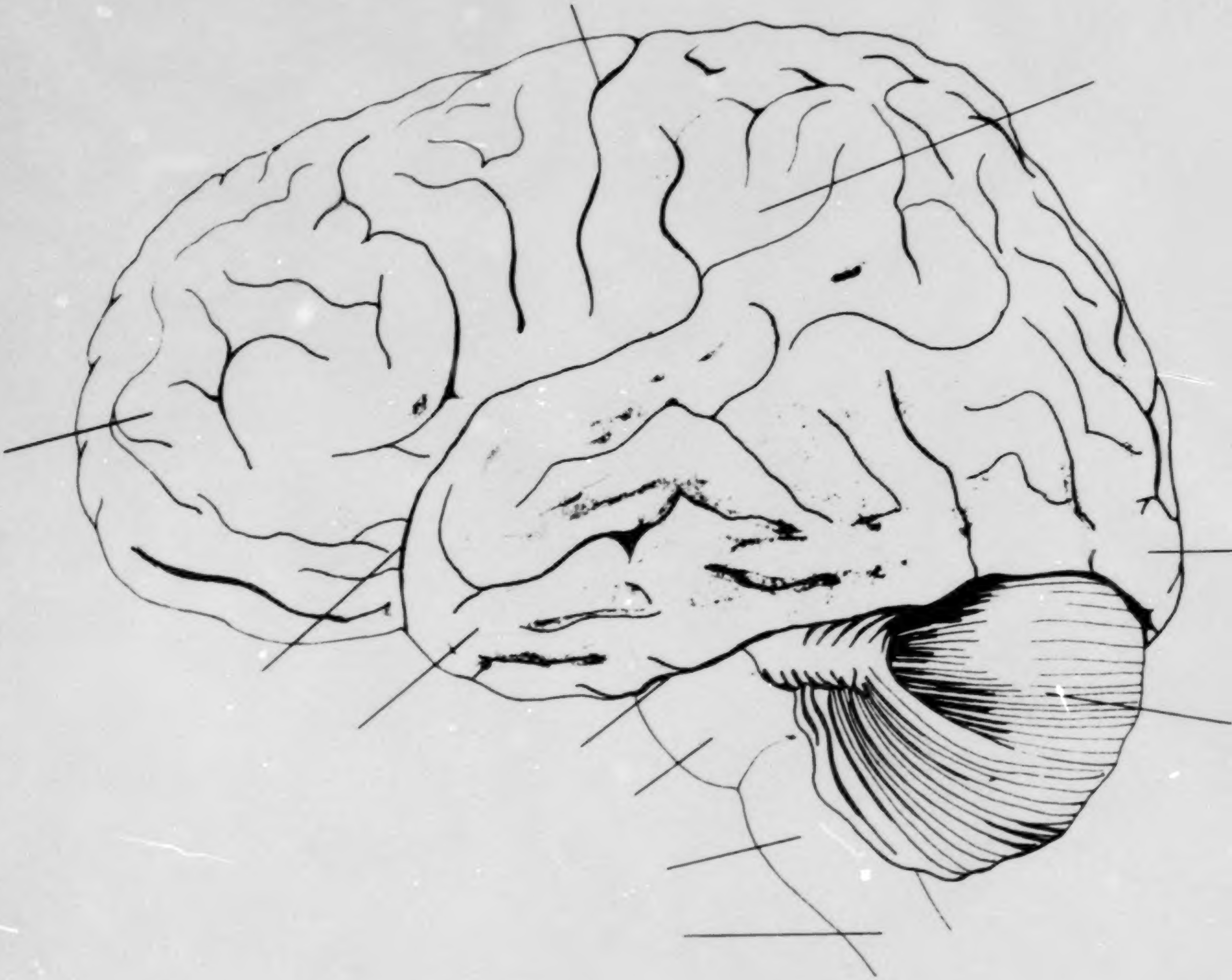
Cerebellum

Pons

Medulla oblongata

Spinal cord

PARTS OF THE BRAIN



UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

ASSIGNMENT SHEET #2--DIAGRAM OF A NEURON

Directions: Label the following parts on the diagram of neuron:

Nucleus

Cell body

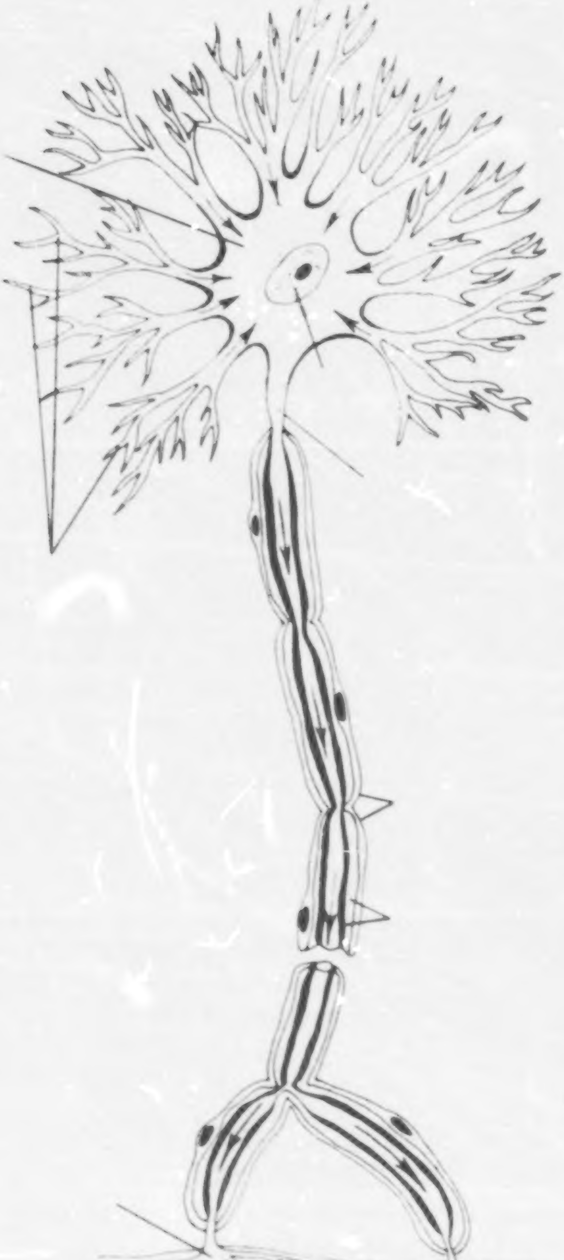
Dendrites

Axon

Neurilemma

Myelin

MOTOR NEURON



UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

ASSIGNMENT SHEET #3--TESTING REFLEXES AND DETERMINATION OF REFERRED PAIN

Directions: Students will work in pairs

1. Ask your partner to sit on a chair, cross one leg over the other and close eyes. Using moderate force, tap the area of the patellar tendon with a rubber hammer or with the edge of your hand. Note the movement of the lower leg in response to this stimulus.

2. Support your partner's elbow in your left hand. With a rubber hammer, tap the tendon of the tricips muscle sharply just above the elbow. Note and describe the movement of the forearm in response to this stimulation.

3. Ask your partner to kneel on a chair with ankles and feet projecting over the edge. Tap the Achilles tendon with a rubber hammer. Note and describe the movements of the foot in response to this stimulation.

4. To demonstrate referred pain:

   Place the tips of the fingers over the ulnar nerve at the elbow and move them back and forth while applying pressure. This will cause a slightly painful, tingling sensation. The sensation will be referred to the hand.

Write the answers to the following questions:

1. What is a reflex?

2. What is a receptor?

3. What is an effector?

4. What is referred pain?

UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

ASSIGNMENT SHEET #4--DIAGRAM OF THE EYE

Directions: Label the following parts of the diagram of the eye:

Optic nerve

Retina

Choroid

Sclera

Pupil

Vitreous body

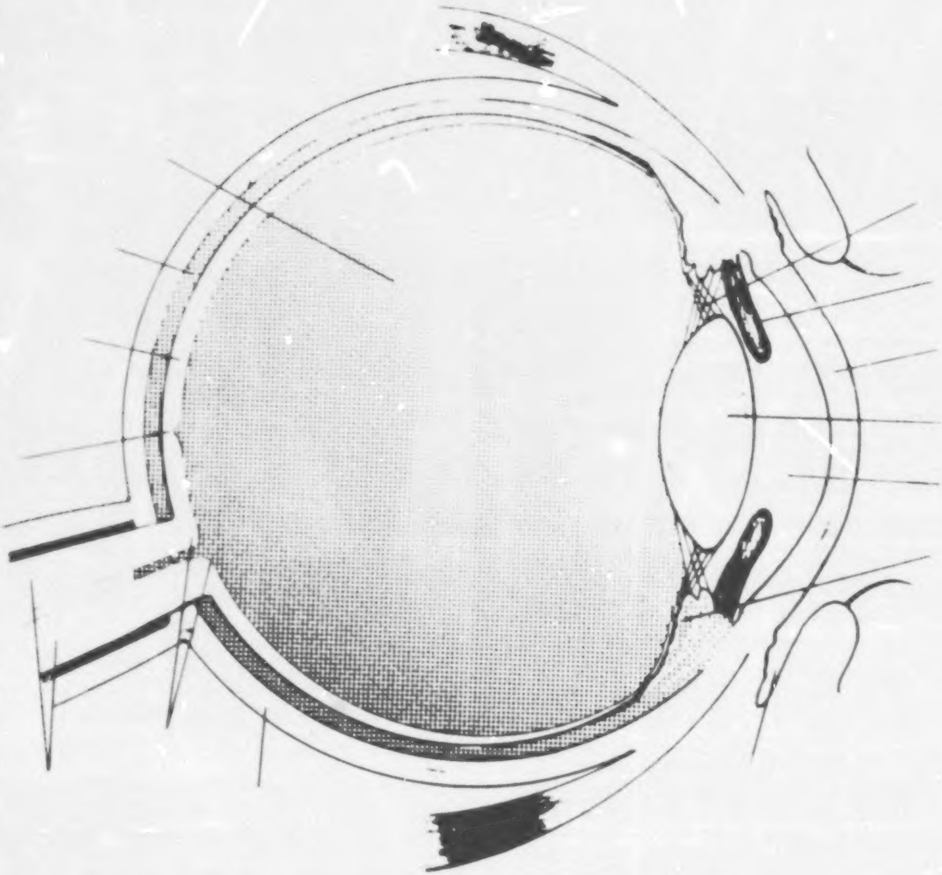
Iris

Cornea

Lens

Ciliary body

PARTS OF THE EYE



UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

ASSIGNMENT SHEET #5--DIAGRAM OF EAR

Directions: Label the following parts of the diagram of the ear:

Pinna

Auditory canal

Tympanic membrane

Eustachian tube

Malleus

Incus

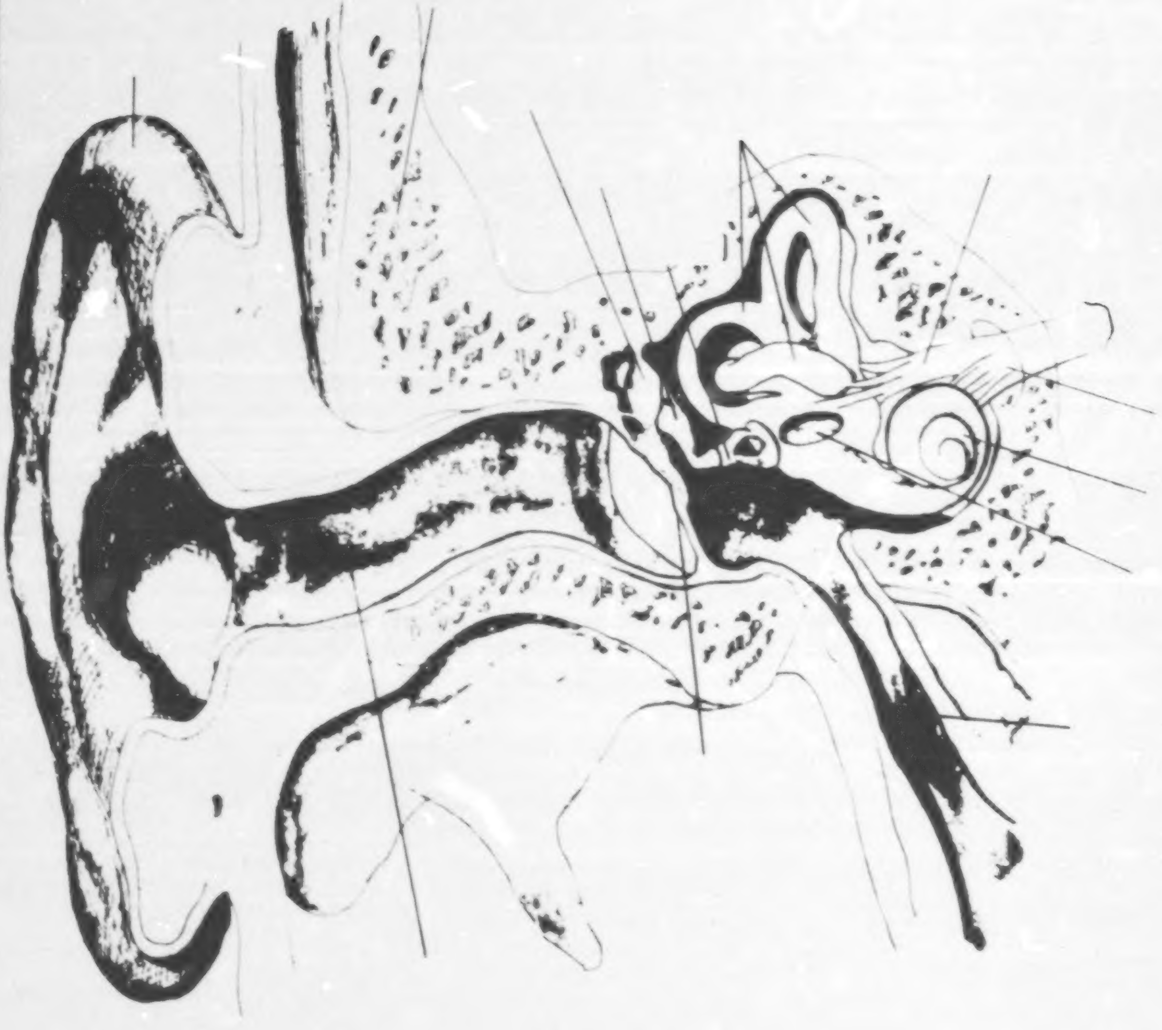
Stapes

Oval window

Cochlea

Semicircular canals

PARTS OF THE EAR



UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

ASSIGNMENT SHEET #6--WORD FIND PUZZLE

Directions: The following terms, which are disorders of the nervous system and special senses, can be found in the puzzle. They may be written forward, backward, vertically, horzontally, or diagonally. Circle each term as you find it.

Anorexia

Astigmatism

Cerebral palsy

Chorea

Conjunctivitis

C.V.A.

Encephalitis

Epilepsy

Glaucoma

Hydrocephalus

Hyperopia

Meningitis

Motion sickness

Multiple sclerosis

Myopia

Neuralgia

Otitis media

Otosclerosis

Paralysis

Poliomyelitis

Shingles

Strabismus

Tinnitus

Vertigo

WORD FIND PUZZLE

M U L T I P L E S C L E R O S I S K H
S C O C O N J U N C T I V I T I S P Y
I T A L A I P O Y M N O N S T U E O P
T V I S V W X O E P Q S E U A S N L E
A B D E C B O N C D I E U L F I K I R
M G E L H I I S J S P K R A G T C O O
G V M G L N M T O N A O A H L I I M P
I E S N G C E R E B R A L P A L S Y I
T R I I P Q E A R S A I G E U A N E A
S T T H T L U B V A L X I C C H O L W
A I I S C X A I Y E Y E A O O P I I Z
S G T S T A K S L R S R O R M E T T S
L O O N Y T O M T O I O L D A C O I L
S T I N N I T U S H S N O Y E N M S O
O E P I L E P S Y C H A C H A E T V T

UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

ANSWERS TO ASSIGNMENT SHEETS

Assignment sheet #1--Labeled diagram VI-TM-1

Assignment sheet #2--Labeled diagram VI-TM-2

Assignment sheet #3--

1. The response to an impulse conducted over a reflex arc
2. The beginning of a dendrite of a sensory nerve
3. The muscles or glands that respond to stimulation
4. Pain seeming to arise in an area other than its actual origin

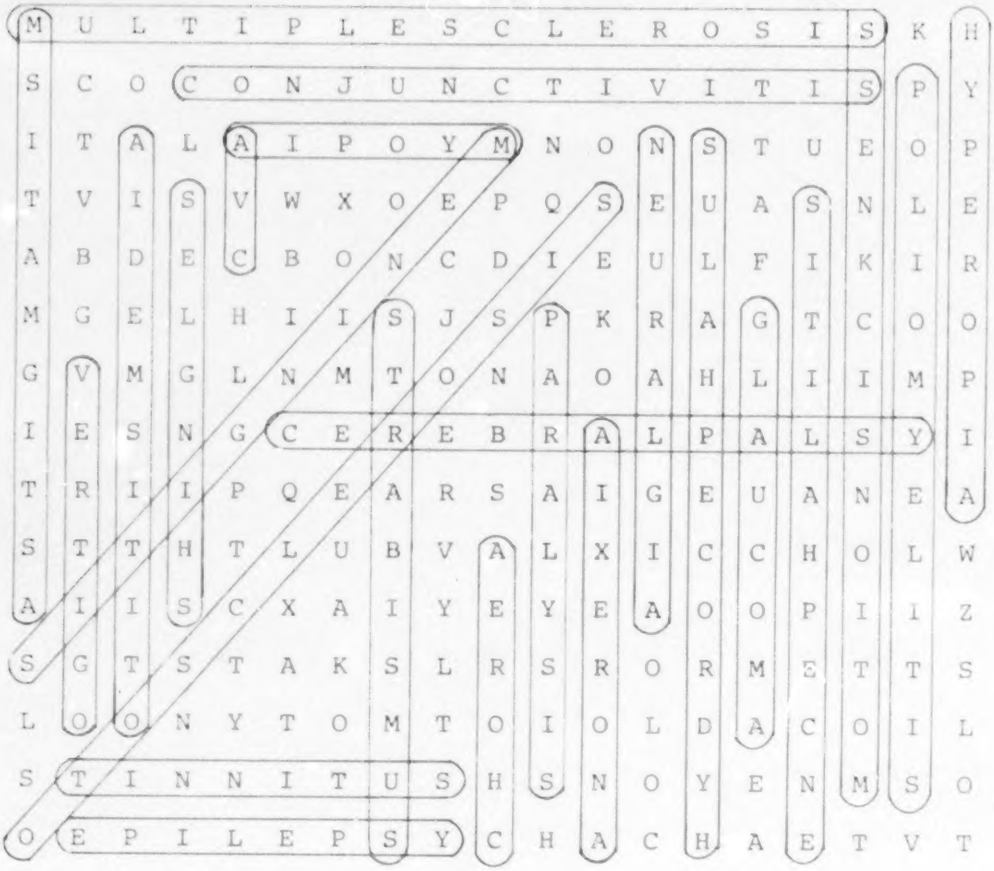
Assignment sheet #4--Labeled diagram VI-TM-3

Assignment sheet #5--Labeled diagram VI-TM-4

Assignment sheet #6--See "Answer to Word Find Puzzle"

ANSWER TO ASSIGNMENT SHEET #6

WORD FIND PUZZLE



```
M U L T I P L E S C L E R O S I S K H
S C O C O N J U N C T I V I T I S P Y
I T A L A I P O Y M N O N S T U E O P
T V I S V W X O E P Q S E U A S N L E
A B D E C B O N C D I E U L F I K I R
M G E L H I I S J S P K R A G T C O O
G V M G L N M T O N A O A H L I I M P
I E S N G C E R E B R A L P A L S Y I
T R I I P Q E A R S A I G E U A N E A
S T T H T L U B V A L X I C C H O L W
A I I S C X A I Y E Y E A O O P I I Z
S G T S T A K S L R S R O R M E T T S
L O O N Y T O M T O I O L D A C O I L
S T I N N I T U S H S N O Y E N M S O
O E P I L E P S Y C H A C H A E T V T
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UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

UNIT TEST

1. Identify the three divisions of the nervous system.

2. Identify the main divisions of the brain by completing the following statements.

   a. The largest part of the brain is the ___________a.

   b. The part of the brain that is continuous with the spinal cord posterionally and with the pons anterionally is the ___________b.

   c. The rounded eminence of the brain on the ventral surface of the brain stem is the ______________c.

   d. The part of the brain composed of two lateral hemispheres and a mid-portion, dorsal to the pons and medulla oblongata is the _____________d.

3. Give two functions of the spinal cord.

   a.

   b.

4. List and describe the three protective layers of the brain and spinal cord.

   a.

   b.

   c.

5. Discuss the function of the cerebrospinal fluid.

6. Identify the divisions of the peripheral nervous system by answering the following questions:

    a. How many pairs of cranial nerves are there?

    b. To what structure are they attached?

    c. Name four parts of the body that send impulses to the brain by means of the cranial nerves.

        1.

        2.

        3.

        4.

    d. How many pairs of spinal nerves are there?

    e. To what structure are they attached?

    f. To what parts of the body do the spinal nerves conduct impulses from the spinal cord?

7. Explain the control of involuntary functions of the body by the sympathetic and parasympathetic nervous systems.

8. Identify terms pertaining to structure and function of neurons and neuroglia by completing the following statements:

A. A nerve cell body and its extensions is a (an) ____________A.

B. Projections that transmit impulses to the nerve cell body are called ____________B.

C. Projections that transmit impulses away from the nerve cell body are called ____________C.

D. The thin, membranous sheath enveloping a peripheral nerve fiber which plays an important role in the regeneration of peripheral nerves is the ____________D.

E. The fatlike substance that forms a protective wrapping around nerve fibers is the ____________E.

F. Three types of neurons are sensory (afferent), interneurons or ____________F.

G. Connective tissue cells that function in supportive, reparative or metabolic capacities are called ____________G.

H. Two types of neuroglia are astrocytes and ____________H.

9. Trace the path of impulses as they travel along a reflex arc.

10. Discuss the physiology of vision.

11. Discuss the physiology of hearing.

12. List five general senses.

A.

B.

C.

D.

E.

13. Match diseases and disorders on the right to their correst definitions.

_____a. Infection of the brain

_____b. Ringing or buzzing sound in ear

_____c. Chronic, slowly progressive disease of the central nervous system due to degeneration of axons

_____d. Defect in vision in which light rays focus in front of retina (nearsightedness)

_____e. Acute viral disease which affects the brain and spinal cord. This virus may destroy motor nerve cells in the spinal cord causing paralysis

_____f. Loss of appetite

_____g. Inflammation of the middle ear

_____h. Temporary or permanent loss of function, expecially loss of sensation or voluntary motion

1. Anorexia
2. Astigmatism
3. Cerebral palsy
4. Chorea
5. Conjunctivitis
6. C.V.A.
7. Encephalitis
8. Epilepsy
9. Glaucoma
10. Hydrocephalus
11. Hyperopia
12. Meningitis
13. Motion sickness

_____i. Congenital brain disorder characterized by diverse disorders of muscles varying from weakness to complete paralysis

_____j. Type of deafness caused by bone changes that prevent normal vibration of the stapes

_____k. An irregularity of the curvature of the lens or cornea of the eye, resulting in faulty vision

_____l. Convulsive nervous disease characterized by involuntary jerking movements

_____m. Severe, sharp pain along the course of a nerve

_____n. Formation of blisters along the course of a nerve, most frequently the intercostal nerves

_____o. Destruction of brain tissue as a result of hermorrhage from cerebral blood vessels

_____p. Inflammation of the membrane covering the brain and spinal cord

_____q. Nausea, vomiting and dizziness induced by irregular or rhythmic movements, as car sickness or sea sickness

_____r. Inflammation of the conjunctiva of the eye

_____s. Impaired vision or blindness as a result of excess pressure of eye fluid

_____t. Sense of movement of self or surroundings, dizziness

14. Multiple sclerosis
15. Myopia
16. Neuralgia
17. Otitis media
18. Otosclerosis
19. Paralysis
20. Poliomyelitis
21. Shingles
22. Strabismus
23. Tinnitus
24. Vertigo

_____u. Gross enlargement of the cranium and atrophy of the brain due to accumulation of excessive amounts of fluid in and around the brain

_____v. Defect in vision in which light rays focus behind the retina (farsightedness)

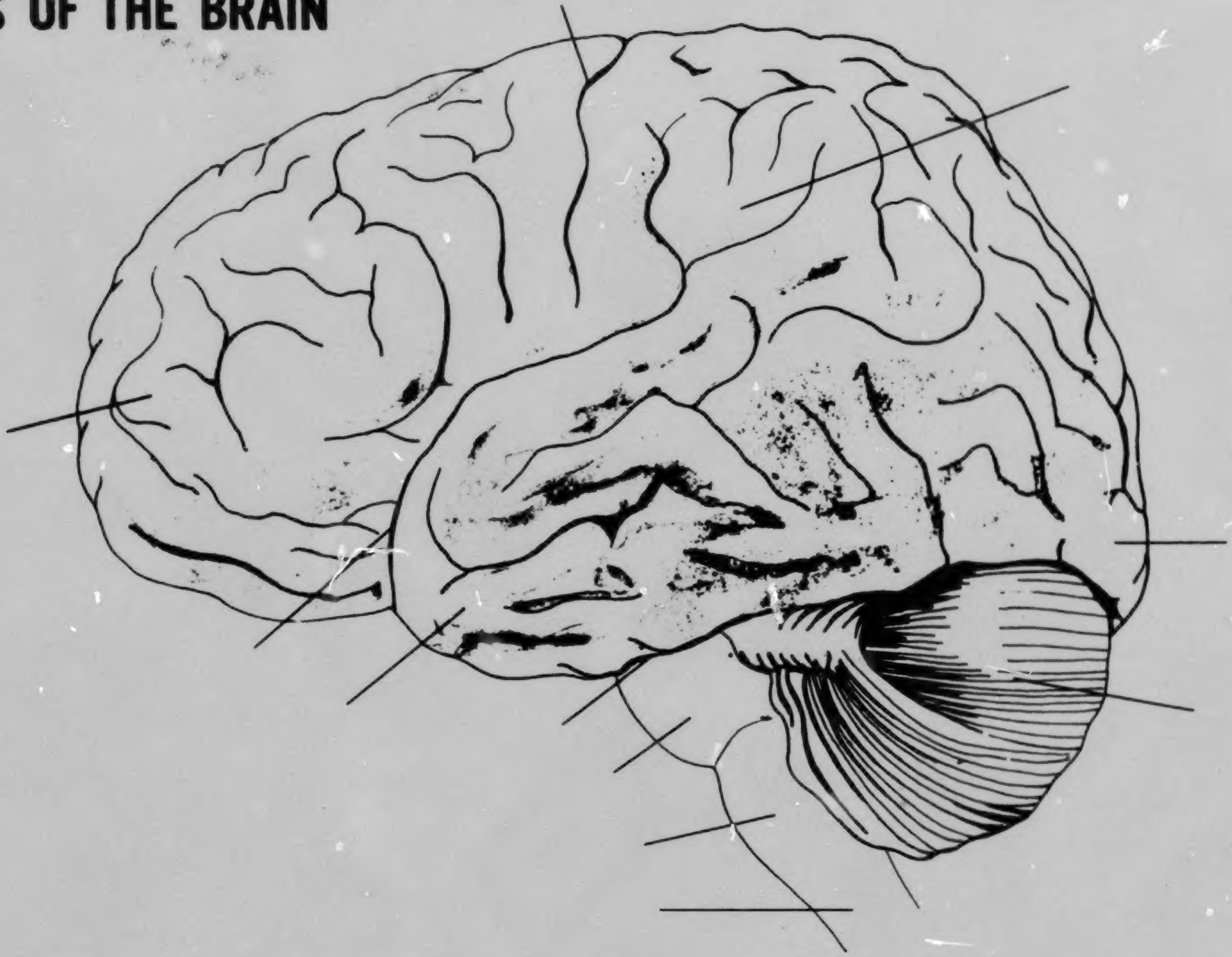
_____w. Chronic disorder with abnormality of brain function without apparent changes in nerve tissue (falling sickness)

_____x. Muscles of eyeballs do not coordinate, so the two eyes do not work together

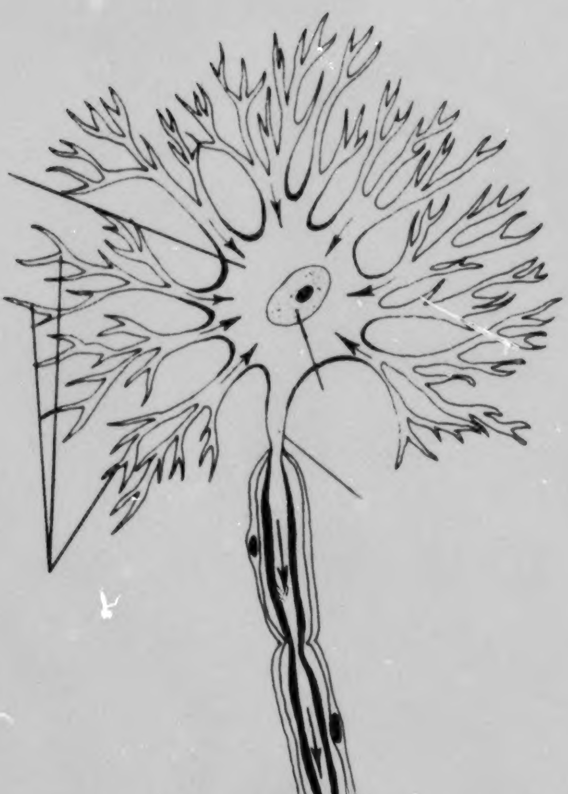
14. Label a diagram of the brain
15. Label a diagram of a neuron
16. Label a diagram of the eye
17. Label a diagram of the ear
18. Test reflexes and determine referred pain
19. Identify names of diseases and disorders of the nervous system and special senses in a puzzle.

(Note: If activities #18 - #19, have not been completed prior to the test, ask the instructor when they should be completed.)

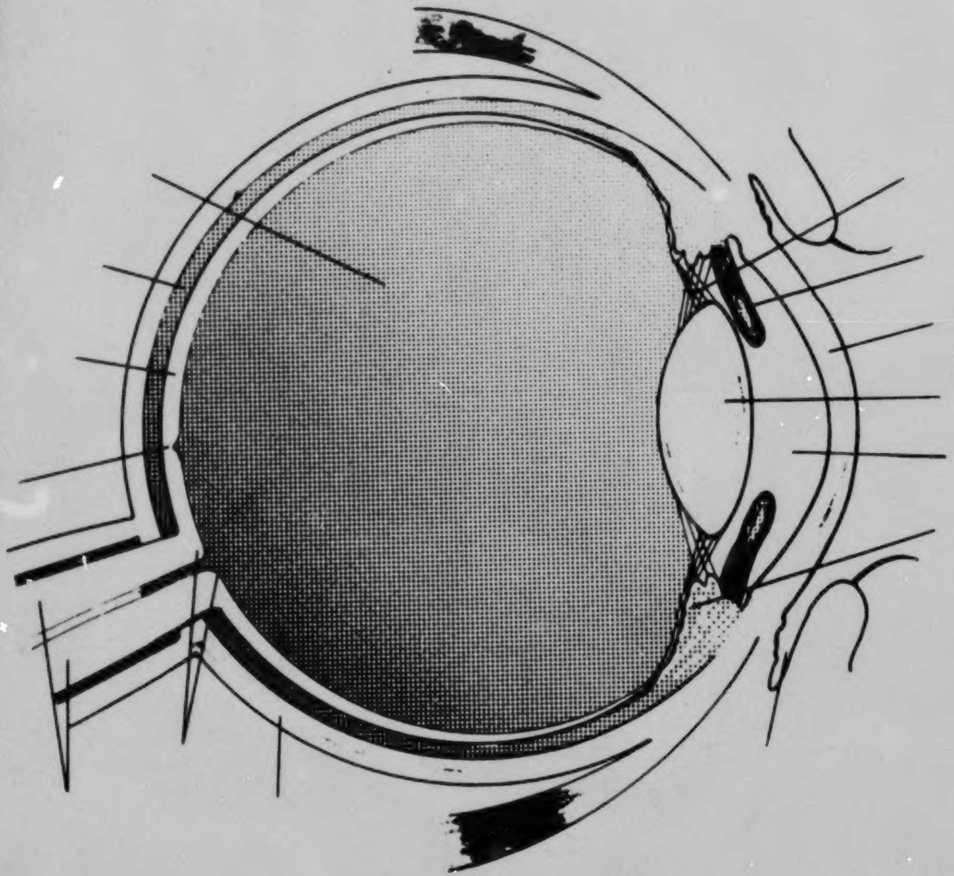
PARTS OF THE BRAIN



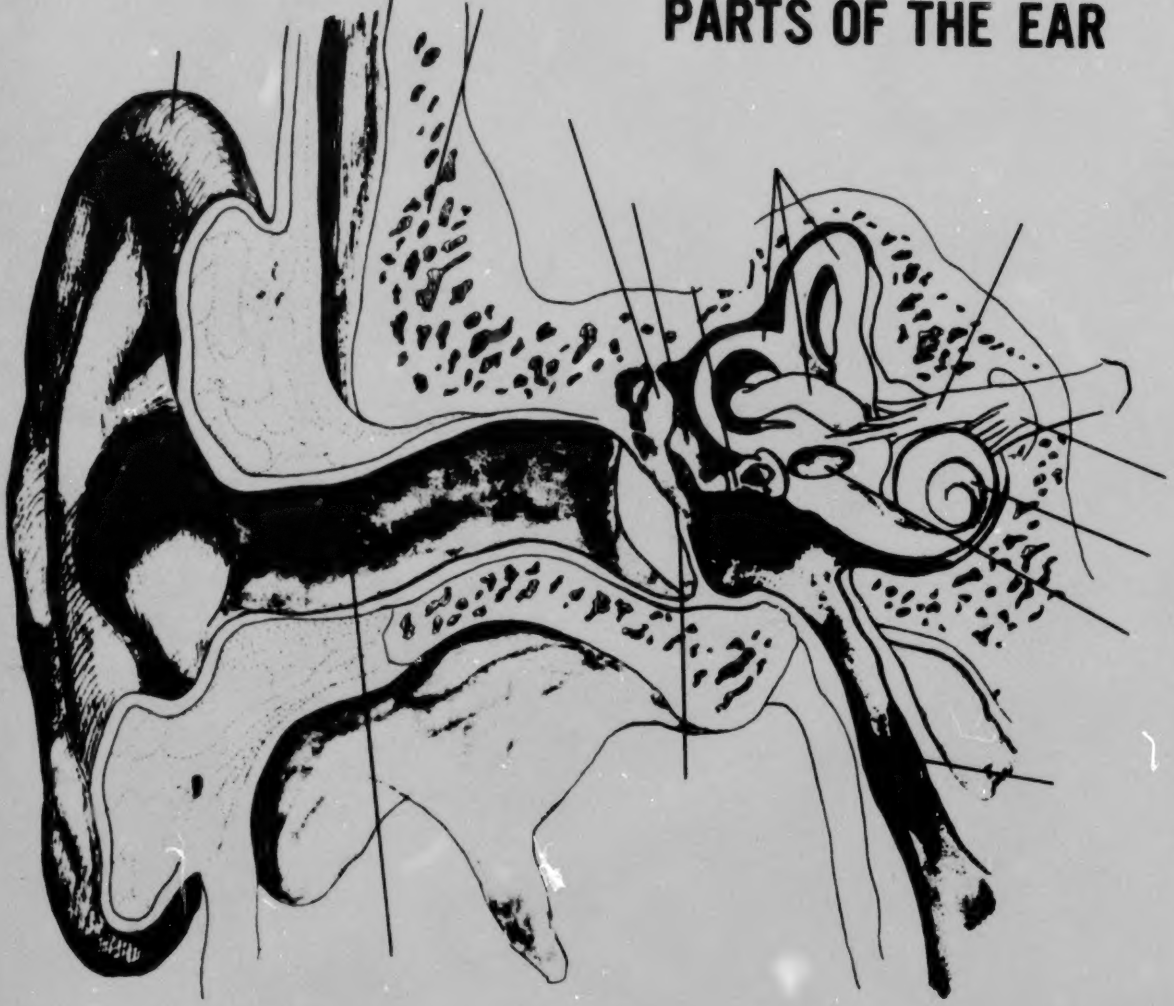
MOTOR NEURON



PARTS OF THE EYE



PARTS OF THE EAR



VI-65

UNIT VI

THE NERVOUS SYSTEM AND SPECIAL SENSES

ANSWERS TO UNIT TEST

1. The central nervous system, consisting of the brain and spinal cord

   The peripheral nervous system consisting of nerves extending to outlying parts of the body

   The autonomic nervous system which controls involuntary functions of the body

2. A. Cerebrum

   B. Medulla oblongata

   C. Pons

   D. Cerebellum

3. A. Contains centers for reflex action

   B. Serves as two-way conduction pathway between brain and nerves

4. A. Dura mater--layer of strong white, fibrous tissue that serves as the outer layer of the meninges and the inner periosteum of cranial bones

   B. Arachnoid membrane--middle layer of the meninges, a delicate cobweb-like tissue that allows space for fluids

   C. Pia mater--inner layer, attached to nerve tissue of brain and spinal cord. The pia mater contains blood vessels, and dips into all depressions of the brain

5. The cerebrospinal fluid serves as a protective cushion around and within the spinal cord. It is formed continuously from the blood, circulates around the brain and spinal cord, and returns to the blood

6. A. 12 pairs

   B. Brain

   C. Head, neck and thoracic and abdominal cavities

D. 31 pairs

E. Spinal cord

F. All parts of body not supplied by cranial nerves

7. The sympathetic nervous system prepares the body for stressful situations as in fear, anger or pain. The parasympathetic system acts as a balance for the sympathetic system. It brings about a return to normal activity of the autonomic nervous system.

8. A. Neuron

B. Dendrites

C. Axons

D. Neurilemma

E. Myelin sheath

F. Motor (efferent)

G. Neuroglia

H. Microglia

9. Impulses travel from a receptor the full length of the sensory neuron's dendrite, through the nerve cell body and axon, to the ends of the axon. The impulse crosses the synapse between the axon of a neuron and the dendrites of a second neuron.

After crossing the synapse, the impulse continues along dendrite of second neuron until the axon of a motor neuron reaches an effector.

The effector, a muscle or gland, responds to stimulation, completing the reflex arc.

10. Discussion should include:
Light rays enter the eye through the cornea. Lens changes thickness to focus rays on retina. Retina translates light energy into nerve impulses. Nerve impulses are conducted to the visual center of the cerebrum.

11. Discussion should include:
Sound waves enter the external auditory canal. The tympanic membrane vibrates, causing ossicles to vibrate.

The vibrations of the oval window cause pressure waves in the liquid of the cochlea. The nerve centers in the cochlea are stimulated by pressure waves and transmit impulses to hearing center in brain

12. Answer will include any five of the following:

Smell
Taste
Pain
Hunger
Thirst
Pressure
Temperature
Position
Touch

13.
7 a.
23 b.
14 c.
15 d.
20 e.
1 f.
17 g.
19 h.
3 i.
18 j.
2 k.
4 l.
16 m.
21 n.
6 o.
12 p.
13 q.
5 r.
9 s.
24 t.
10 u.
11 v.
8 w.
22 x.

14. See VI-TM-1

15. See VI-TM-2

16. See VI-TM-3

17. See VI-TM-4

18. Evaluated to the satisfaction of the instructor.

19. Evaluated to the satisfaction of the instructor.

UNIT VII

THE URINARY SYSTEM

UNIT OBJECTIVE

The student will be able to identify terms and disorders related to the urinary system. The student will also be able to describe the parts of and give function of the urinary system and discuss dialysis and transplants. This knowledge will be evidenced through application and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Match terms and definitions related to the urinary system
2. Point out the parts of the urinary system
3. Cite the functions of the urinary system
4. Give the steps in the formation of urine by the kidneys
5. Summarize the characteristics of urine
6. Identify disorders of the urinary system
7. Discuss dialysis and transplants
8. Label a diagram of the urinary system
9. Label a diagram depicting the anatomy of the kidney

UNIT VII

THE URINARY SYSTEM

SUGGESTED ACTIVITIES

I. Instructor:

  A. Provide objective sheet

  B. Discuss objective sheet

  C. Pass out information sheet

  D. Discuss information sheet

  E. Make and show transparencies

  F. Distribute and discuss assignment sheets

  G. Use model of urinary system to point out parts

  H. Invite resource speakers to discuss dialysis, organ transplants, and donor banks

  I. Give test and evaluate results

II. Student:

  A. Read and discuss objective sheet

  B. Read and discuss material contained in information sheet

  C. Complete assignment sheets

  D. Observe or participate in demonstration of parts of urinary system

  E. Listen to presentations of speakers

  F. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

B. Information sheet

C. Transparancey masters

  1. VII-TM-1--Diagram of the urinary system

  2. VII-TM-2--Diagram of external and internal anatomy of the kidney

D. Assignment sheets

  1. Assignment sheet #1--Diagram of the urinary system

2. 2. Assignment sheet #2--Diagram of external and internal anatomy of the kidney

E. Answers to assignment sheets

F. Test

G. Answers to test

II. References: Books

A. Anderson, Paul D. Clinical Anatomy and Physiology for Allied Health Sciences. Philadelphia, Pennsylvania: W.B. Saunders, 1976.

B. Anthony, Catherine Parker and Irene B. Alyn. Structure and Function of the Body. 5th ed. St. Louis, Missouri: C.V. Mosby Company, 1976

C. Anthony, Catherine Parker and Norma Jane Kolthoff. Textbook of Anatomy and Physiology. 9th ed. St. Louis, Missouri: C.V. Mosby Company, 1975

D. Jacob, Stanley W. and Clarice Ashworth Francone. Structure and Function in Man. 3rd ed. Philadelphia, Pennsylvania: W.B. Saunders Company, 1974.

E. Memmler, Ruth Lundeen and Dena Lin Wood. The Human Body in Health and Disease. 4th ed. Philadelphia, Pennsylvania: J.B. Lippincott Company, 1977.

UNIT VII

THE URINARY SYSTEM

INFORMATION SHEET

I. Terms and definitions:

   A. Albumin--A protein found in blood; may be present in urine in some disease conditions

   B. Catheter--A tube for removing fluids from, or injecting fluids into a body cavity, as the urinary bladder

   C. Cystoscope--Instrument used for interior examination of urinary bladder and ureters

   D. Dialysis--Diffusion of dissolved substance through a semipermeable membrane

   E. Diffusion--The spreading of molecules from a region of higher concentration to a region of lower concentration

   F. Enuresis--Involuntary bed-wetting in children over three years of age

   G. Excretion--The elimination of waste products from the body

   H. Micturition--Urination

   I. Semipermeable membrane--Membrane that permits the full passage of some substances but restricts the passage of others

   J. Transplant--Transfer of tissue or organ from one person to another

   K. Urea--Chief nitrogenous constituent of urine, an end product of protein metabolism

II. Parts of the urinary system

   A. Kidneys

      1. Size, shape, location

         a. Average size is 4½" x 2" x 1"

        b. Bean-shaped

        c. Located on posterior abdominal wall behind the peritoneum at level of twelfth thoracic and first three lumbar vertebrae

    2. Anatomy

        a. External

            (1) Capsule - Covers and protects kidney

            (2) Hilum - Concave notch on medial surface of kidney

        b. Internal

            (1) Coxtex - Outer layer of kidney

            (2) Medulla - Interior of kidney

            (3) Renal pyramids - Wedge-shaped parts of medullary material

            (4) Renal columns - Inward extensions of coxtex between pyramids

    3. Microscopic anatomy

        a. Bowman's capsule - Cuplike depression which is the beginning of the convoluted tubule

        b. Glomerulus - Cluster of capillaries invaginated in Bowman's capsule

        c. Renal corpuscle - Bowman's capsule with glomerulus

        d. Nephron - Renal corpuscle, loop of Henle and straight tubule

B. Ureters--Tubes from ten to twelve inches long extending from kidneys to urinary bladder

C. Urinary bladder--Muscular bag in which urine collects. It lies in the pelvic cavity behind the pubic bones

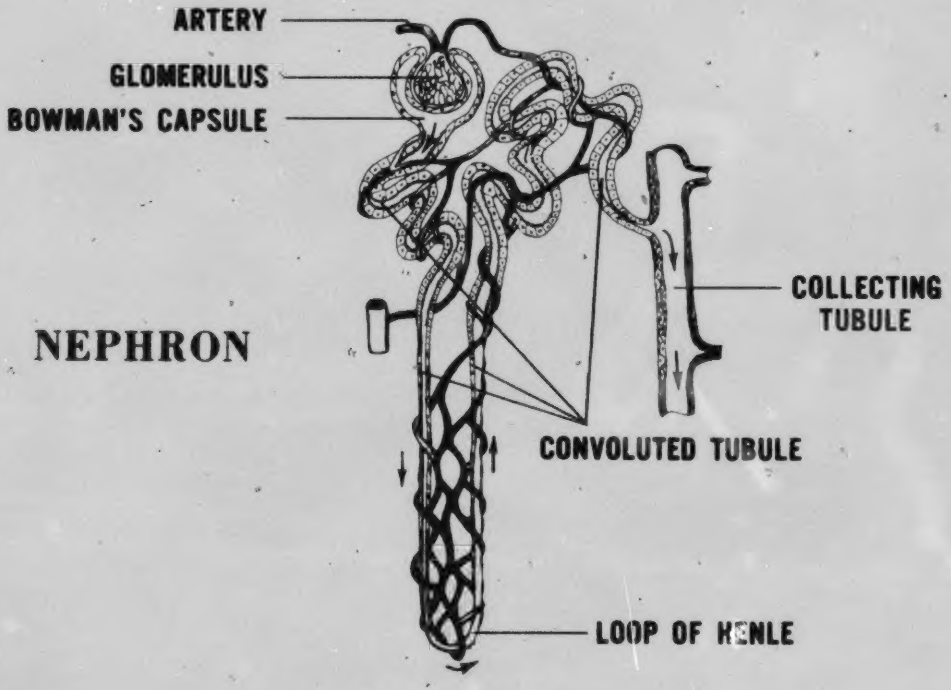
D. Urethra--Tube passing from anterior part of urinary bladder to outside of body

III. Functions of the urinary system

- A. Excretion of waste products from blood
- B. Regulation of water balance of body
- C. Regulation of acid-base balance of the body

IV. Formation of urine

- A. Blood flows to kidney by means of renal artery
- B. In the kidney, the blood flows from artery through progressively smaller vessels to the glomeruli
- C. Water and solutes from the blood filter through the gloumerular walls into Bowman's capsule, normally at the rate of 125 ml/minute
- D. This filtrate then flows into the convoluted tubules, the loop of Henle and finally into the collecting tubules of the nephron
- E. Approximately 97-99% of the water and some of the solute from this filtrate are reabsorbed, re-enter the blood stream, and ultimately leave the kidney by way of the renal vein


ARTERY
GLOMERULUS
BOWMAN'S CAPSULE
COLLECTING TUBULE
CONVOLUTED TUBULE
LOOP OF HENLE

NEPHRON

F. The remainder of the filtrate is collected in collecting tubules. Then it flows into the pelvis of the kidney, leaves the kidney by means of the ureter, and is collected in the urinary bladder as urine

G. Thus, the waste solutes and water are filtered from the blood by the kidney to form urine. The remaining solutes and water are returned to the circulating blood

V. Characteristics of urine

A. Approximately 1500 ml. produced in 24 hours, although the quantity varies greatly with fluid intake, perspiration and other factors

B. Components of urine

1. Water, 95%

2. Nitrogenous wastes as urea, uric acid, ammonia and creatinine

3. Electrolytes as sodium, potassium, ammonia, chloride, bicarbonate, phosphate, and sulphate

4. Toxins - (during disease)

5. Pigments

6. Hormones

7. Abnormal constituents as glucose, albumin, blood, or calculi

VI. Disorders of the urinary system

A. Anuria--Complete urinary suppression or failure of kidney functions

B. Calculus--An abnormal concretion within the body, as a kidney stone

C. Cystitis--Inflammation of the bladder

D. Dysuria--Painful urination-symptom of various disease conditions

E. Edema--Condition in which body tissues contain an excessive amount of tissue fluid

- F. Glycosuria--Presence of glucose in the urine
- G. Incontinence--Inability to retain urine
- H. Nephritis (Bright's disease)--Severe inflammation of the kidneys
- I. Oliguria--Diminished amount of urine formed
- J. Polyuria--Excessive secretion and discharge of urine
- K. Pyelitis--Inflammation of the pelvis of the kidney
- L. Uremia--Condition in which nitrogenous wastes normally excreted by the kidney are retained in the blood
- M. Urethritis--Inflammation of the urethra

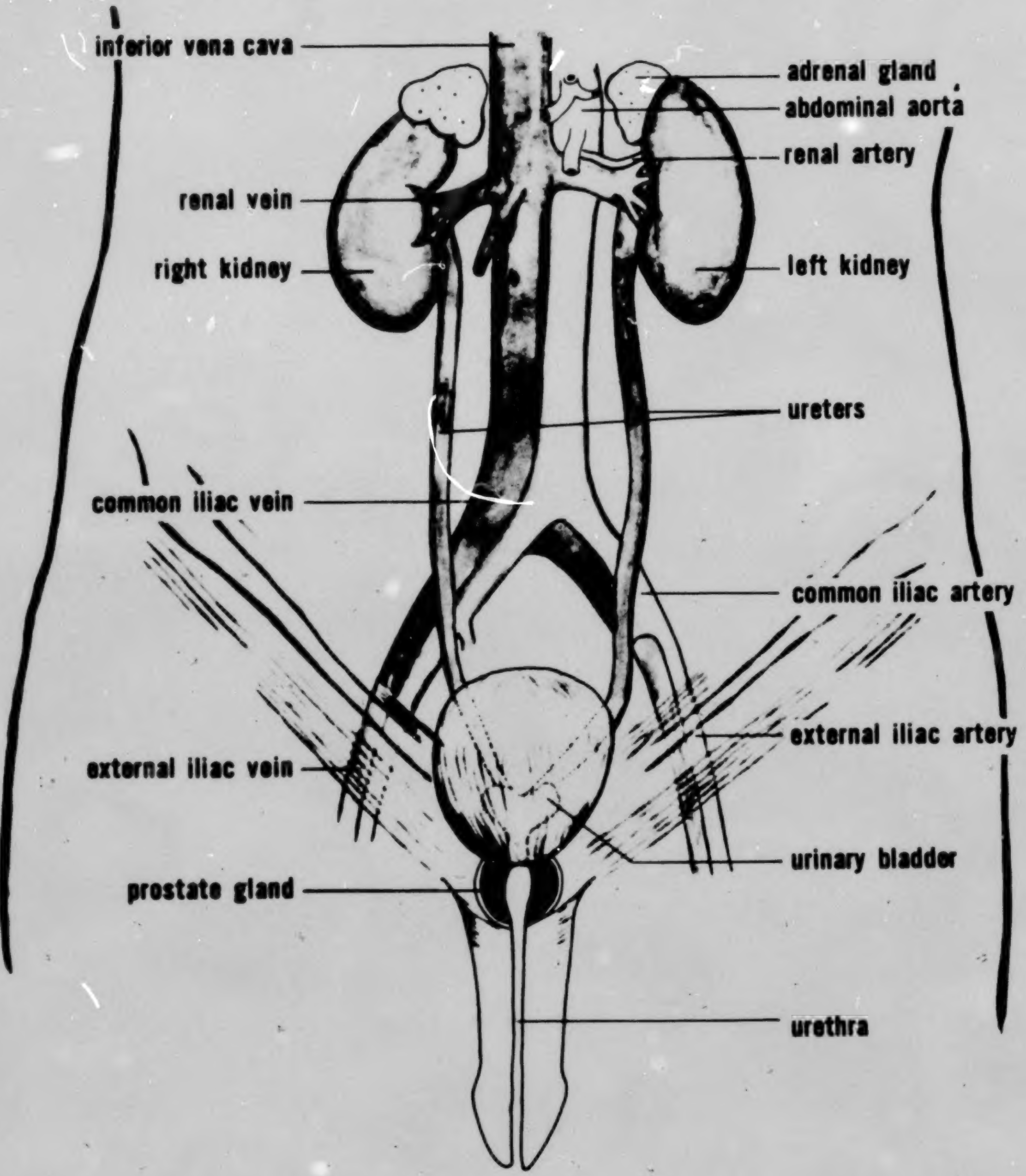
VII. Dialysis and transplants

- A. Dialysis
  - 1. Treatment for patients who have defective kidney function, with a resulting accumulation of nitrogenous waste products in the blood
  - 2. The patient's blood is passed through a cellophane spiral tube which is bathed in a solution of chemicals that approximate blood components
  - 3. Waste from the patient's blood passes through the walls of the cellophane tube into the bath solution, thus cleansing the blood
- B. Transplants
  - 1. Transplant procedures are most successful when the donor is closely related to the recipient
  - 2. Procedure is used for patients suffering from renal failure
  - 3. Problems in kidney transplant
    - a. Tissue rejection

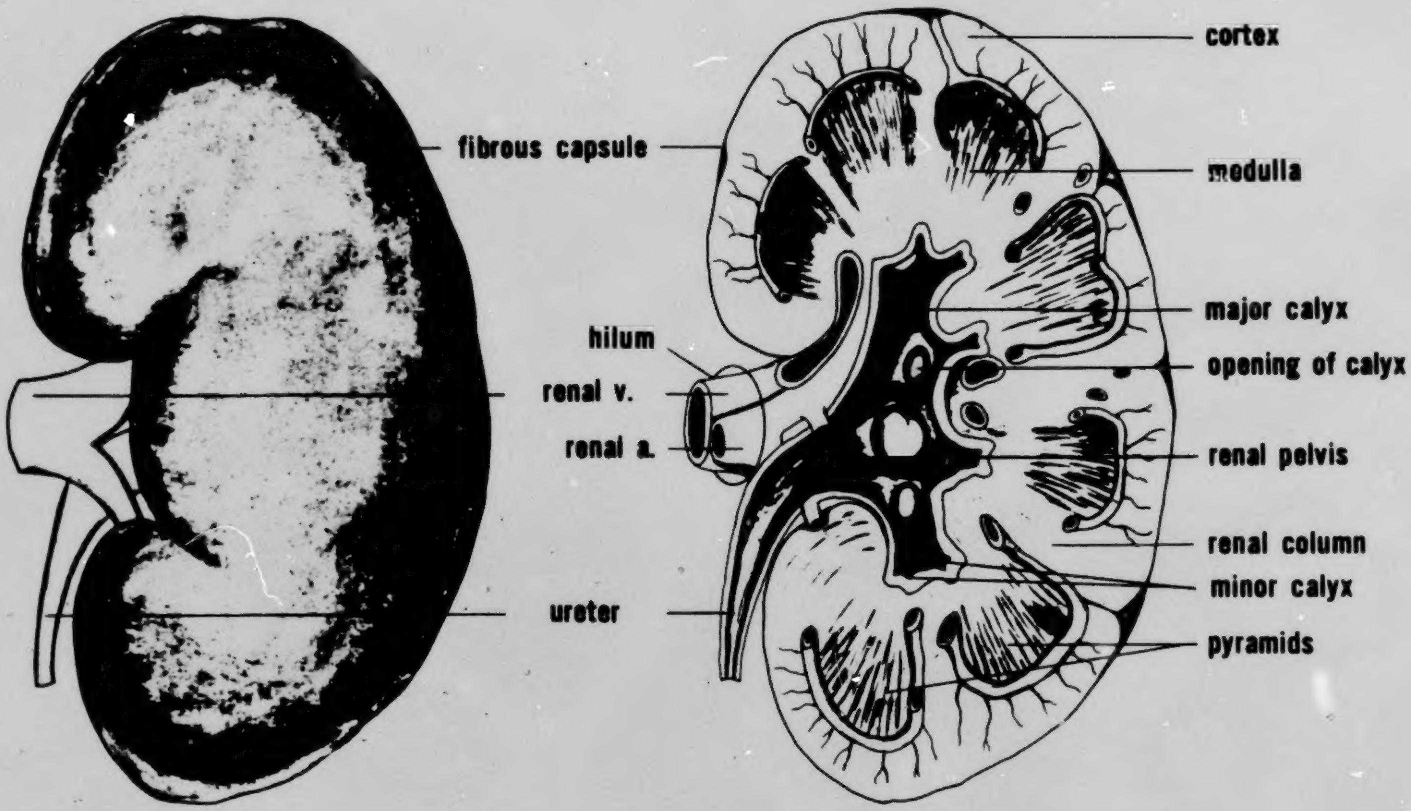
   b. Cause of damage to original kidney may subsequently affect the transplanted kidney

4. Living Bank--Organization that coordinates donations of organs

THE URINARY SYSTEM


inferior vena cava
adrenal gland
abdominal aorta
renal artery
renal vein
right kidney
left kidney
ureters
common iliac vein
common iliac artery
external iliac artery
external iliac vein
urinary bladder
prostate gland
urethra

EXTERNAL AND INTERNAL ANATOMY OF THE KIDNEY


fibrous capsule
hilum
renal v.
renal a.
ureter
cortex
medulla
major calyx
opening of calyx
renal pelvis
renal column
minor calyx
pyramids

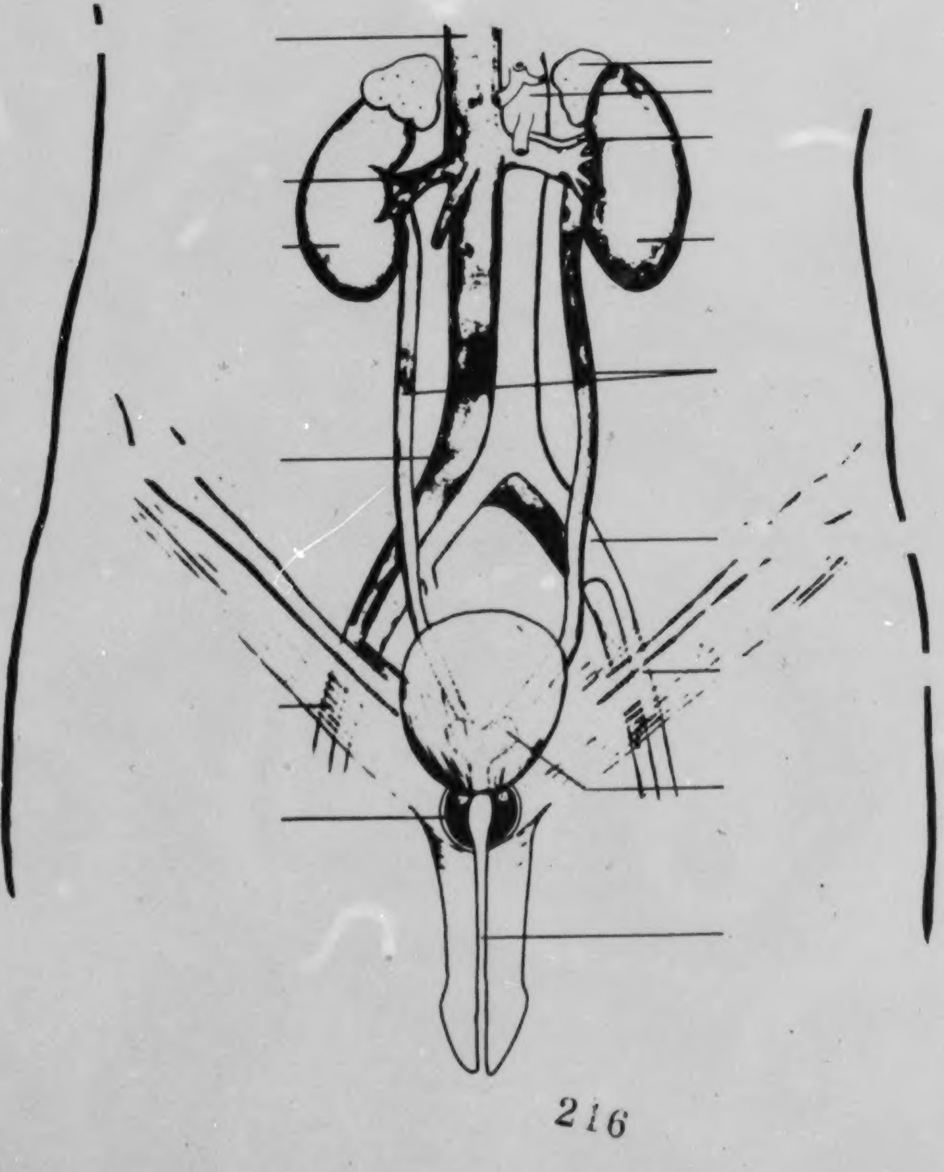
UNIT VII

THE URINARY SYSTEM

ASSIGNMENT SHEET #1--DIAGRAM OF THE URINARY SYSTEM

Directions: Label the following parts of the diagram of the urinary system.

renal artery
renal vein
left kidney
right kidney
ureters
urinary bladder
urethra



UNIT VII

THE URINARY SYSTEM

ASSIGNMENT SHEET #2--DIAGRAM OF EXTERNAL AND INTERNAL ANATOMY OF KIDNEY

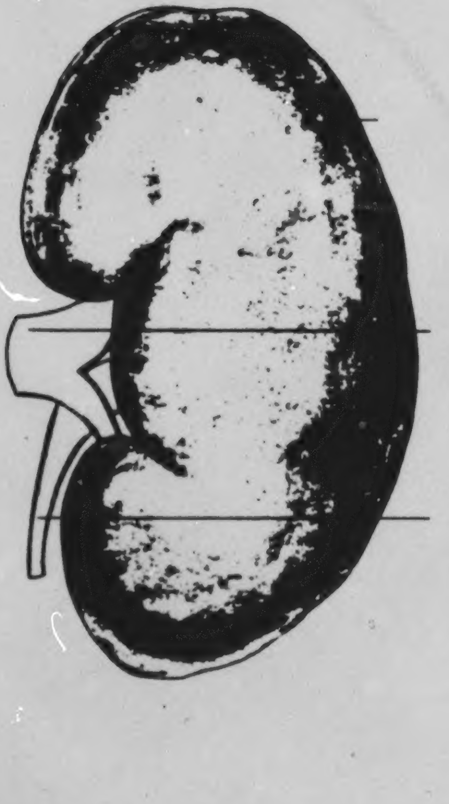
Directions: Label the following parts of the diagram of external and internal anatomy of the kidney.

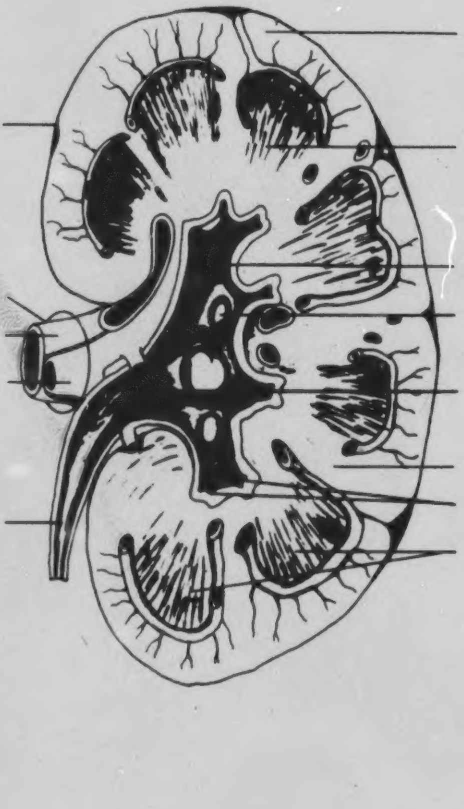
External Anatomy of Kidney

- Capsule
- Renal vein
- Renal artery
- Ureter

Internal Anatomy of Kidney

- Cortex
- Medulla
- Hilum
- Pyramids
- Renal column





UNIT VII

THE URINARY SYSTEM

ASSIGNMENT SHEET #3--FORMATION OF URINE

Directions: Trace the steps in the formation of urine by completing the following statements:

1. Blood flows to the kidney by means of the blood vessel called the ____________
2. Blood flows through progressively smaller vessels of the kidney until it reaches the ____________
3. Water and solutes from blood filter through glomerular walls into ____________
4. Filtrate moves into the convoluted tubules, the loop of Henle and finally into the collecting ________ of the nephron ____________
5. As the filtrate moves through the convoluted tubule and the loop of Henle, 97-99% of the water and some of the solute from the filtrate are ____________
6. The remainder of the filtrate eventually leaves the kidney by means of the ____________
7. Waste solutes and water filtered from the blood by the kidney form ____________

UNIT VII

THE URINARY SYSTEM

ASSIGNMENT SHEET #4--WORD SCRAMBLE

Directions: Unscramble the letters below to form the following words associated with disorders of the urinary system:

Anuria
Calculus
Cystitis
Dysuria

Edema
Glycosuria
Incontinence
Nephritis

Oliguria
Polyuria
Pyelitis
Uremia
Urethritis

1. TISPLYEI _ _ _ _ _ _ _ _
2. RISTHUREIT _ _ _ _ _ _ _ _ _ _
3. RUNAIA _ _ _ _ _ _
4. RUDIAYS _ _ _ _ _ _ _
5. PULORIAY _ _ _ _ _ _ _ _
6. RIMUEA _ _ _ _ _ _
7. CULUSAC _ _ _ _ _ _ _ _
8. DAEME _ _ _ _ _
9. GUROILIA _ _ _ _ _ _ _ _
10. STITIYSC _ _ _ _ _ _ _ _
11. CONTINEENCIN _ _ _ _ _ _ _ _ _ _ _ _
12. CYSURIALOG _ _ _ _ _ _ _ _ _ _
13. RIPHTISEN _ _ _ _ _ _ _ _ _

UNIT VII

THE URINARY SYSTEM

ANSWERS TO ASSIGNMENT SHEET

Assignment sheet #1--Labeled diagram VII-TM-1

Assignment sheet #2- Labeled diagram VII-TM-2

Assignment sheet #3--Formation of urine

1. Renal artery
2. Glomeruli (us)
3. Bowman's capsule
4. Tubules
5. Reabsorbed
6. Ureter
7. Urine

Assignment sheet #4--Word scramble

1. PYELITIS
2. URETHRITIS
3. ANURIA
4. DYSURIA
5. POLYURIA
6. UREMIA
7. CALCULUS
8. EDEMA
9. OLIGURIA
10. CYSTITIS
11. INCONTINENCE
12. GLYCOSURIA
13. NEPHRITIS

UNIT VII

THE URINARY SYSTEM

UNIT TEST

1. Match the terms on the right to their correct definitions using number answers.

_____ a. Urination

_____ b. Diffusion of a dissolved substance through a semipermeable membrane

_____ c. Instrument used for interior examination of urinary bladder and ureters

_____ d. Protein found in blood, may be present in urine in some disease conditions

_____ e. Involuntary bed-wetting in children over three years of age

_____ f. Transfer of tissue or organ from one person to another

_____ g. Chief nitrogenous constituent of urine, an end product of protein metabolism

_____ h. Tube for removing fluids from or injecting fluids into a body cavity, as the urinary bladder

_____ i. The spreading of molecules from a region of higher concentration to a region of lower concentration

_____ j. The elimination of waste products from the body

_____ k. Membrane that permits the free passage of some substances but restricts the passage of others

1. Albumin
2. Catheter
3. Cystocope
4. Dialysis
5. Diffusion
6. Enuresis
7. Excretion
8. Micturition
9. Semipermeable
10. Transplant
11. Urea

2. Point out the parts of the urinary system and of the external and internal anatomy of the kidney pictured on the accompanying pages

3. Cite the functions of the urinary system

   A.

   B.

   C.

4. Give the steps in urine formation by the kidneys

   A.

   B.

   C.

   D.

   E.

5. Summarize the characteristics of urine by answering the following questions:

   A. What is the approximate volume of urine produced in a 24-hour period?

   B. List seven possible components of urine.

      1.

      2.

      3.

      4.

      5.

      6.

      7.

6. Identify disorders of the urinary system by completing the following statements:

   A. A diminished amount of urine is ____________

B. The inability to retain urine is ______________

C. The presence of glucose in urine is ______________

D. An abnormal concretion within the body, as a kidney stone, is a (an) ______________

E. The condition in which body tissues contain an excessive amount of tissue fluid is ______________

F. Inflammation of the urethra is ______________

G. Severe inflammation of the kidneys (Bright's disease) is called ______________

H. Inflammation of the pelvis of the kidney is ______________

I. Painful urination is ______________

J. Inflammation of the bladder is ______________

K. Excessive secretion and discharge of urine is ______________

L. The condition in which nitrogenous waste normally excreted by the kidney are retained in the blood is ______________

M. A complete suppression of urine, or failure of kidney function is ______________

7. Discuss dialysis and transplants

A. Dialysis

A. Dialysis (continued)

B. Transplants

8. Label a diagram of the urinary system

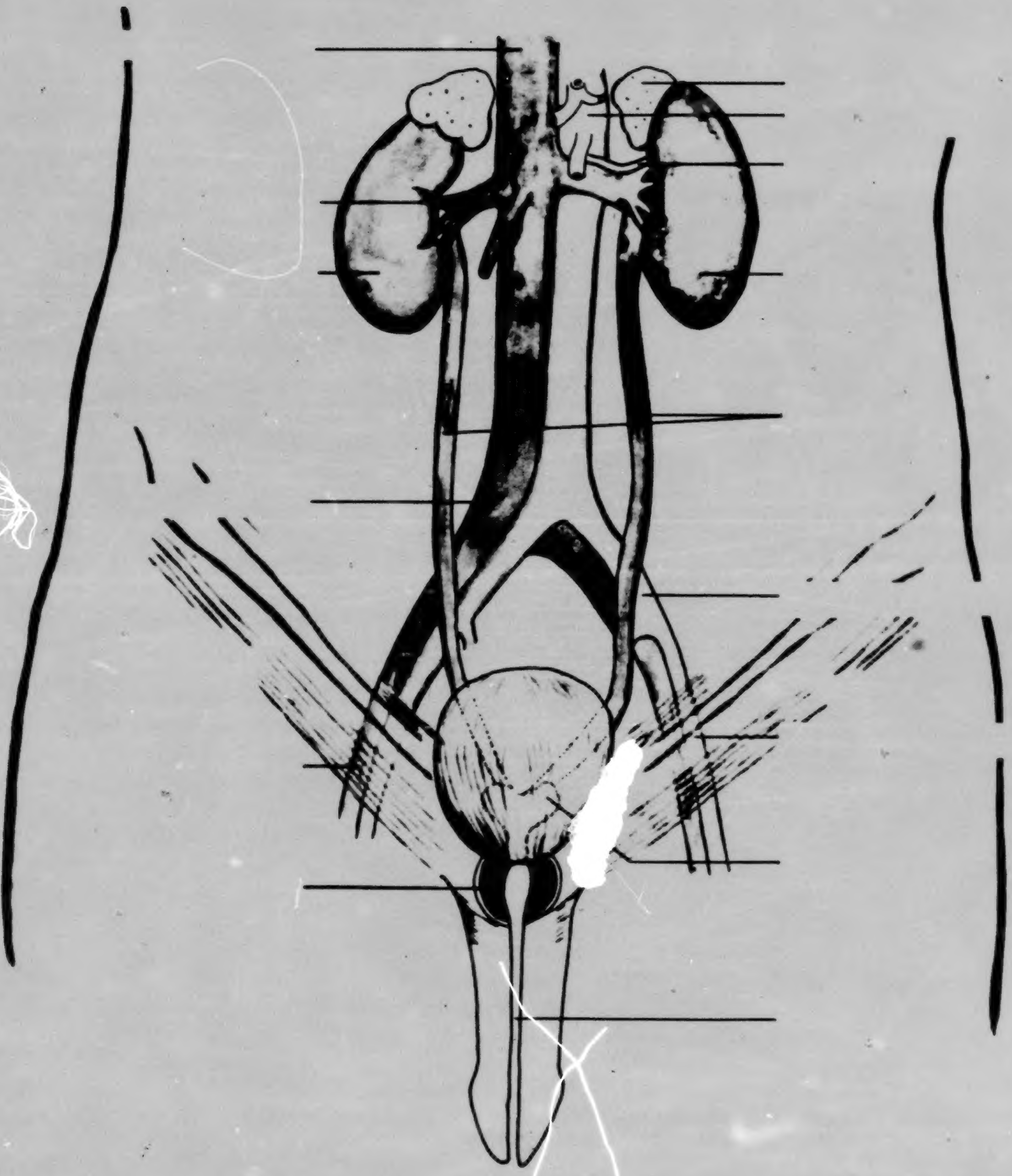
9. Label a diagram depicting the anatomy of the kidney

10. Trace the steps in the formation of urine

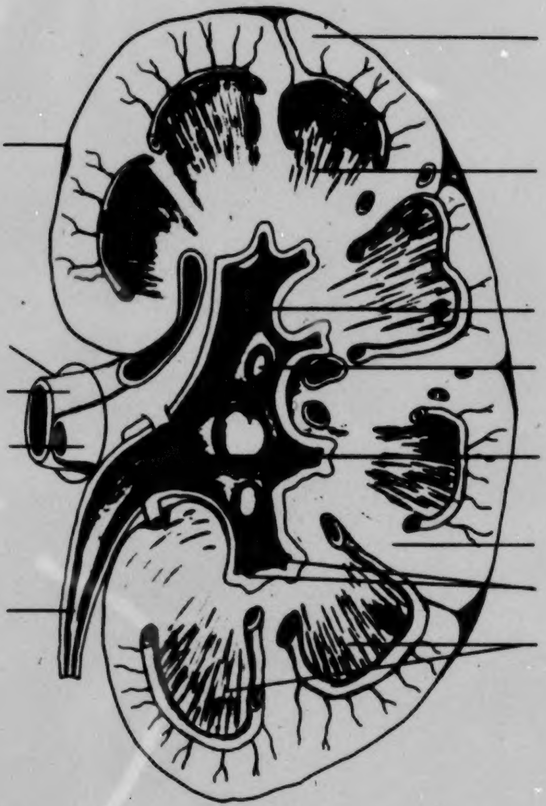
11. Complete word scramble puzzle

(Note: If activities #8, #9, #10 and #11 have not been completed prior to the test, ask the instructor when they should be completed.)

THE URINARY SYSTEM



EXTERNAL AND INTERNAL ANATOMY OF THE KIDNEY



UNIT VII

THE URINARY SYSTEM

ANSWERS TO UNIT TEST

1. 8 a.
   4 b.
   3 c.
   1 d.
   6 e.
   10 f.
   11 g.
   2 h.
   5 i.
   7 j.
   9 k.

2. See VII-TM-1 Diagram of the urinary system and VII-TM-2 Diagram of the external and internal anatomy of the kidney

3. A. Excretion of waste products form the blood

   B. Regulation of the water balance of the body

   C. Regulation of acid-base balance of the body

4. A. Blood flows to kidney by means of the renal artery

   B. In the kidney, blood flows from the artery through progressively smaller vessels to the glomeruli

   C. Water and solutes from the blood filter through the glomerular walls into Bowman's capsule, normally at the rate of 125 ml/minute.

   D. This filtrate then flows into the convaluted tubules, the loop of Henle, and finally into the collecting tubules of the nephron

   E. Approximately 97-99% of the water, and some of the solute from this filtrate are reabsorbed, re-enter the blood stream, and ultimately leave the kidney by way of the renal vein

   F. The remainder of the filtrate is collected in collecting tubules. Then it flows into the pelvis of the kidney, leaves the kidney by means of the ureter, and is collected in the urinary bladder

G. Thus, the waste solutes and water are filtered from the blood by the kidney to form urine. The remaining solutes and water are returned to the circulating blood

5. A. 1500 ml.

B. 1. Water 95%

2. Nitrogenous wastes as urea, uric acid, ammonia and calatinine

3. Electrolytes as sodium, potassium, ammonia, chloride, bicarbonate, phosphate and sulphate

4. Toxins - during disease

5. Pigments

6. Hormones

7. Abnormal constituents as glucose, albumin, blood or calculi

6. A. Oliguria

B. Incontinence

C. Glycosuria

D. Calculus

E. Edema

F. Urethritis

G. Nephritis

H. Pyelitis

I. Dysuria

J. Cystitis

K. Polyuria

L. Uremia

M. Anuria

7. A. Dialysis

Dialysis is used to treat patients who have defective kidney function with a resulting accumulation of nitrogenous waste products in the blood

The patient's blood is passed through a cellophane spiral tube which is bathed in a solution of chemicals that approximate blood components

Waste from the patient's blood passes through the walls of the cellophane tube into the bath solution, thus cleansing the blood.

B. Transplants

Transplant procedures are most successful when the donor is closely related to the recipient.

The procedure is used for patients suffering from renal failure.

Problems in kidney transplants are:

Tissue rejection

Cause of damage to the original kidney may subsequently affect the transplanted kidney

The Living Bank is an organization that coordinates donations of organs.

8. Evaluated to the satisfaction of the instructor

9. Evaluated to the satisfaction of the instructor

10. Evaluated to the satisfaction of the instructor

11. Evaluated to the satisfaction of the instructor

UNIT VIII

THE REPRODUCTIVE SYSTEM

UNIT OBJECTIVE

After completing this unit of instruction the student will be able to recognize terms relating to reproduction. The student will also be able to identify and give the function of the male and female reproductive parts, to discuss the menstrual cycle and pregnancy, and to identify common disorders of the reproductive system

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Match terms to definitions
2. Identify parts of the male and female reproductive system
3. Review the sequence of events in the menstrual cycle
4. Discuss the phases of pregnancy and parturition
5. Recognize disorders of pregnancy
6. Recognize disorders of the reproductive system
7. Identify the function of parts of the reproductive system
8. Recognize words associated with pregnancy and the menstrual cycle in a word scramble puzzle
9. Select, in a word-find puzzle, terms which are disorders of the reproductive system or pregnancy

UNIT VIII

THE REPRODUCTIVE SYSTEM

SUGGESTED ACTIVITIES

I. Instructor:
    - A. Provide objective sheet
    - B. Discuss objective sheet
    - C. Pass out information sheet
    - D. Discuss information sheet
    - E. Distribute and discuss assignment sheets
    - F. Use torso model, chart,or reference books to demonstrate parts of the reproductive system
    - G. Give test and evaluate results

II. Student:
    - A. Read and discuss objective sheet
    - B. Participate in discussion of objective sheet
    - C. Read information sheet
    - D. Participate in discussion of information sheet
    - E. Complete assignment sheets
    - F. Observe or participate in demonstration of parts of the reproductive system using torso model, chart, or references
    - G. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets

    1. Assignment Sheet #1--Identification of Function of Parts of the Reproductive System

    2. Assignment Sheet #2--Word Scramble

    3. Assignment Sheet #3--Word Find Puzzle

  D. Answers to assignment sheets

  E. Test

  F. Answers to test

II. References: Books

  A. Anderson, Paul D. Clinical Anatomy and Physiology for Allied Health Sciences. Philadelphia, Pennsylvania: W.B. Saunders, 1976.

  B. Anthony, Catherine Parker and Irene B. Alyn. Structure and Function of the Body. 5th ed. St. Louis, Missouri: C.V. Mosby Company, 1976

  C. Anthony, Catherine Parker and Norma Jane Kolthoff. Textbook of Anatomy and Physiology. 9th ed. St. Louis, Missouri: C.V. Mosby Company, 1975

  D. Memmler, Ruth Lundeen and Dena Lin Wood. The Human Body in Health and Disease. 4th ed. Philadelphia, Pennsylvania: J.B. Lippincott Company, 1977.

UNIT VIII

THE REPRODUCTIVE SYSTEM

INFORMATION SHEET

I. Terms

A. Circumcision--surgical removal of all or part of the foreskin of the penis

B. Embryo--early or developing stage of any organism; in humans, the first weeks of uterine life

C. Episiotomy--incision of perineum at the end of the second stage of labor to avoid laceration of perineum and facilitate delivery

D. Fertilization--union of an ovum with a sperm cell to produce a zygote

E. Fetus--latter stages in developing child in uterus from about the third month of pregnancy to birth

F. Hermaphrodite--an individual with both male and female sex organs

G. Hysterectomy--surgical removal of the uterus

H. Mastectomy--surgical removal of the breast and axillary lymph modes, frequently done if patient has breast tumors

I. Menstruation--cyclic uterine bleeding which normally occurs at approximately four-week intervals in the absence of pregnancy. Controlled by hormones

J. Ovulation--periodic discharge of ovum from ovary

K. Papanicolaou stain--stain used in detection of cancer cells, particularly of cells from the vagina and cervix

L. Reproduction--process by which offspring are produced

M. Semen--secretion of reproductive organs of the male containing sperm cells and secretions from accessory reproductive glands

N. Spermatazoan--male reproductive cell (sperm cell)

O. Vasectomy--surgical procedure resulting in sterilization of males. A portion of the ductus deferens on each side is removed, thus preventing sperm cells from reaching the urethra

P. Zygote--Cell produced by the union of an egg cell with a sperm cell

II. Parts of the reproductive system

A. Female parts

1. Ovaries--Primary reproductive organs of female; found in upper part of pelvic cavity, one on each side of uterus, produce ova

2. Ovum--Female sex cell, produced in ovaries

3. Fallopian tube (uterine tube)--duct leading from point near the ovaries to the uterus. Transports ovum from body cavity to uterus

4. Fimbriae--fringelike extensions from the fallopian tubes. When an ovum is released the fimbriae work like tentacles to draw the ovum into the uterine tube.

5. Uterus--Organ for containing and nourishing the embryo during pregnancy

6. Vagina--Muscular tube connecting uterus with exterior of body

7. Bartholin's glands (vulvovaginal glands)--glands above and to each side of the vaginal opening. Produce mucus.

8. Vulva--External parts of female reproductive system

9. Perineum--Pelvic floor (commonly used to mean the area between vaginal opening and anus)

B. Male

1. Scrotum--Sac containing the testes
2. Penis--Male organ of sexual intercourse
3. Testes--Male reproductive glands, produce sperm cells and secrete male sex hormones
4. Epididymis--Tube inside testes in which sperm cells are collected and stored until they mature and become motile
5. Ductus deferens (vas deferens)--continuation of epididymis extending to juncture with the seminal vesicle
6. Seminal vesicle--Tubes extending from the area back of urinary bladder to the ductus deferens. Secretes mucoid substance which nourishes sperm cells
7. Prostate gland--Surrounds neck of bladder and urethra. Ducts open into prostatic portion of urethra - produces fluid which is a constituent of semen that helps maintain motility of spermatozoa
8. Ejaculatory ducts--Terminal portion of seminal duct, formed by union of ductus deferens and excretory duct of seminal vesicle
9. Cowper's glands (bulbourethral)--Pair of glands found beneath the bulb of the urethra, produce mucous secretion
10. Sperm cell--Male reproductive cell

III. Menstrual cycle

A. Changes in female hormone secretions occur in a 28-day cycle

B. Ovulation occurs at about the middle of each 28 day period

C. Uterine wall prepares for implantation of fertilized ovum (zygote)

D. If fertilization does not occur, the lining of the uterine wall sloughs off, and is expelled.

E. The loss of lining leaves some areas bleeding; thus blood is also discharged from uterus

F. After 4-7 days, the uterine wall begins to prepare again for pregnancy

G. Menstruation usually begins in females from ages 10-16 years and indicates production of ova

H. Menopause is stage at which menstrual cycle ceases; usually occurs between ages of 45-50

I. Menstrual cycle is controlled by hormones

IV. Pregnancy

A. Fertilization normally occurs when the ovum is about one-third of the way down the fallopian tube. The fertilized egg continues the passage down the tube until it reaches the uterus.

B. Six to eight days after fertilization the zygote becomes implanted in uterine wall.

C. The formation of the placenta begins after implantation. The placenta functions in the exchange of food, gases and wastes between mother and baby.

D. The placenta also serves as barrier against bacteria between mother and baby. Blood-borne diseases as syphilis and some viruses may affect the fetus. Antibodies are transmitted from mother to embryo and fetus.

E. Duration of pregnancy

1. 280 days

2. To calculate date for delivery - add one year and seven days to date of last menstrual period and subtract three months

F. Parturition--Process of giving birth to a child; labor

1. Stages of labor

a. First stage of labor - regular uterine contractions, rupture of membrane, complete dilation of cervix of uterus

b. Second stage - extends from complete dilation to delivery of infant. Episiotomy prevents tearing of perineum

c. Delivery of placenta

2. Mechanism of initiating labor results from hormonal balance and timing; actual process is poorly understood

V. Disorders of pregnancy

A. Ectopic pregnancy--Fertilized ovum is implanted at a site other than the uterine cavity as in the fallopian tube

B. Abortion--Loss of embryo or fetus during the first 20 weeks of pregnancy

1. Spontaneous abortion--Abortion that occurs without having been induced

2. Induced abortion--Termination of pregnancy by artificial means

a. Criminal abortion--abortions performed illegally

b. Therapeutic abortion-abortions performed by physicians for a variety of reasons

C. Miscarriage--Loss of fetus between 20 and 28 weeks of preganancy

D. Placenta previa--Abnormal condition in which the placenta is attached to the lower part of the uterus

VI. Disorders of the reproductive system

A. Amenorrhea--Absence of menstrual flow

B. Cryptorchidism--Failure of testes to descend into the scrotum

C. Dysmenorrhea--Painful menstruation

D. Gonorrhea--Venereal disease caused by a bacterium. Characterized by purulent urethral discharge

E. Hermaphroditism--Both male and female sex organs found in the same person. No known case in which this condition has resulted in fertility, either as male or female

F. False hermaphroditism--Genitalia of one sex evident, secondary sex characteristics of opposite sex predominate

G. Inguinal hernia--Rupture in abdominal wall, in region of wall where testes decend from abdomen into scrotum

H. Leukorrhea--Vaginal discharge

I. Orchitis--Inflammation of the testes due to trauma, mumps, or other infection

J. Phimosis--Tightness of foreskin of penis - remedied by circumcision

K. Prostatism--Any condition resulting in obstruction of the prostate gland with accompanying retention of urine in the bladder

L. Salpingitis--Inflammation of fallopian tubes

M. Sterility--Inability to reproduce

N. Syphilis--Infectious venereal disease characterized by lesions which may involve any organ or tissue

O. Tumor--Swelling or enlargement; may occur in any part of the reproductive system; common in breast. May be benign or malignant.

UNIT VIII

THE REPRODUCTIVE SYSTEM

ASSIGNMENT SHEET #1--IDENTIFICATION OF FUNCTION OF PARTS OF THE REPRODUCTIVE SYSTEM

Directions: The functions of various parts of the reproductive system are given below. Using the information sheet, place the name of the indicated part in the blank spaces.

1. Glands that produce mucus, located above and to each side of the vaginal opening ______________ 1.
2. Sac containing male gonads ______________ 2.
3. Tube inside testis in which sperm cells are collected and stored until they mature and become motile ______________ 3.
4. Pelvic floor (commonly used to mean the area between vaginal opening and anus) ______________ 4.
5. External parts of the female reproductive system ______________ 5.
6. Male reproductive glands, produce sperm cells and secrete male hormones ______________ 6.
7. Gland that surrounds the neck of the bladder and urethra. Ducts open into prostatic portion of urethra, produces fluid which is a constituent of semen and that helps to maintain motility of sperm cells ______________ 7.
8. Fringelike extensions from the abdominal openings of the fallopian tubes ______________ 8.
9. Female sex cell ______________ 9.
10. Male sex cell ______________ 10.

11. Muscular tube connecting the uterus with the exterior of the body ______________ 11.

12. Male organ of sexual intercourse ______________ 12.

13. Continuation of the epididimis extending to the juncture with the seminal vesicle ______________ 13.

14. Primary reproductive organs of the female that produce ova ______________ 14.

15. Organ for containing and nourishing the embryo during pregnancy ______________ 15.

16. Duct leading from point near ovaries to the uterus, transports ovum from body cavity to uterus ______________ 16.

17. Pair of glands found beneath bulb of urethra, produce a mucous secretion ______________ 17.

18. The terminal portion of the seminal duct formed by the union of the ductus deferens and the excretory duct of the seminal vesicle ______________ 18.

19. Tubes extending from the area of the urinary bladder to the ductus deferens. Secretes a mucoid substance which nourishes sperm cells ______________ 19.

UNIT VIII

THE REPRODUCTIVE SYSTEM

ASSIGNMENT SHEET #2--WORD SCRAMBLE

Directions: Unscramble the letters below to form words associated with pregnancy and the menstrual cycle

1. CLAPTENA _ _ _ _ _ _ _ _
2. IZOFRETAITNLI _ _ _ _ _ _ _ _ _ _ _ _ _
3. GYZTEO _ _ _ _ _ _
4. VOUM _ _ _ _
5. TSUREU _ _ _ _ _ _
6. STUREMNTANIO _ _ _ _ _ _ _ _ _ _ _ _
7. PUANEMSOE _ _ _ _ _ _ _ _ _
8. MHNOERN _ _ _ _ _ _ _
9. CYNAGRPEN _ _ _ _ _ _ _ _ _
10. TARPRUINIOT _ _ _ _ _ _ _ _ _ _ _

UNIT VIII

THE REPRODUCTIVE SYSTEM

ASSIGNMENT SHEET #3--WORD FIND PUZZLE

Directions: The following terms, which are disorders of the reproductive system and of pregnancy, can be found in the puzzle. They may be written forward, backward, vertically, horizontally or diagonally. Circle each term as you find it.

Abortion

Amenorrhea

Cryptorchidism

Dysmenorrhea

Ectopic pregnancy

Gonorrhea

Hermaphroditism

Inguinal hernia

Leukorrhea

Miscarriage

Orchitis

Phimosis

Placenta previa

Prostatism

Salpingitis

Sterility

Syphilis

Tumor

UNIT VIII

THE REPRODUCTIVE SYSTEM

ASSIGNMENT SHEET #3--WORD FIND PUZZLE

Y	A	I	N	R	E	H	L	A	N	I	U	G	N	I
C	O	S	V	A	W	T	B	Q	U	A	S	H	R	T
N	L	E	U	K	O	R	R	H	E	A	I	E	S	O
A	L	S	I	S	O	M	I	H	P	B	T	R	T	P
N	M	E	G	A	I	R	R	A	C	S	I	M	S	R
G	G	O	N	O	R	R	H	E	A	T	H	A	T	M
E	H	P	M	P	O	S	A	B	T	O	C	P	E	S
R	I	R	N	N	P	T	B	U	U	P	R	H	F	I
P	J	S	E	O	J	U	M	V	V	S	O	R	G	T
C	K	M	F	P	K	O	N	O	I	T	R	O	B	A
I	A	E	H	R	R	O	N	E	M	S	Y	D	C	T
P	L	A	C	E	N	T	A	P	R	E	V	I	A	S
O	M	B	D	F	Y	T	I	L	I	R	E	T	S	O
T	S	Y	P	H	I	L	I	S	J	S	F	I	T	R
C	R	Y	P	T	O	R	C	H	I	D	I	S	M	P
E	S	A	L	P	I	N	G	I	T	I	S	M	N	O

UNIT VIII

THE REPRODUCTIVE SYSTEM

ANSWERS TO ASSIGNMENT SHEETS

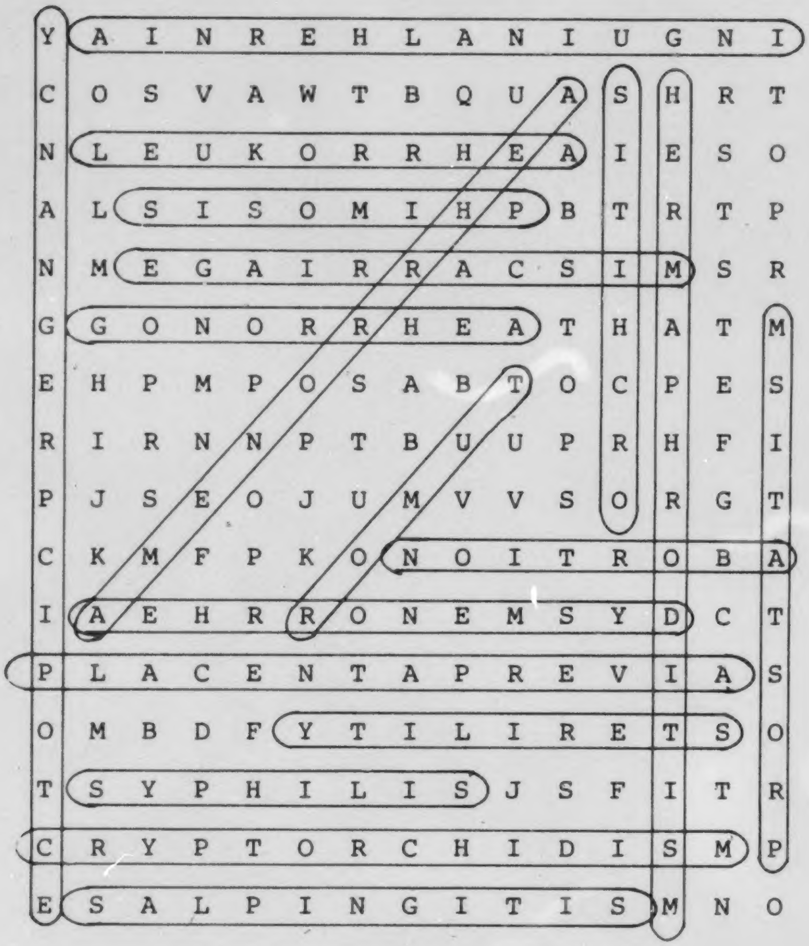
Assignment Sheet #1

1. Bartholin's gland
2. Scrotum
3. Epididymis
4. Perineum
5. Vulva
6. Testes
7. Prostate
8. Fimbriae
9. Ovum
10. Sperm cell
11. Vagina
12. Penis
13. Ductus deferens
14. Ovaries
15. Uterus
16. Fallopian tubes
17. Cowper's glands
18. Ejaculatory duct
19. Seminal vesicle

Assignment Sheet #2

1. Placenta
2. Fertilization
3. Zygote
4. Ovum
5. Uterus
6. Menstruation
7. Menopause
8. Hormone
9. Pregnancy
10. Parturition

Answer to Assignment Sheet #3



Y	A	I	N	R	E	H	L	A	N	I	U	G	N	I
C	O	S	V	A	W	T	B	Q	U	A	S	H	R	T
N	L	E	U	K	O	R	R	H	E	A	I	E	S	O
A	L	S	I	S	O	M	I	H	P	B	T	R	T	P
N	M	E	G	A	I	R	R	A	C	S	I	M	S	R
G	G	O	N	O	R	R	H	E	A	T	H	A	T	M
E	H	P	M	P	O	S	A	B	T	O	C	P	E	S
R	I	R	N	N	P	T	B	U	U	P	R	H	F	I
P	J	S	E	O	J	U	M	V	V	S	O	R	G	T
C	K	M	F	P	K	O	N	O	I	T	R	O	B	A
I	A	E	H	R	R	O	N	E	M	S	Y	D	C	T
P	L	A	C	E	N	T	A	P	R	E	V	I	A	S
O	M	B	D	F	Y	T	I	L	I	R	E	T	S	O
T	S	Y	P	H	I	L	I	S	J	S	F	I	T	R
C	R	Y	P	T	O	R	C	H	I	D	I	S	M	P
E	S	A	L	P	I	N	G	I	T	I	S	M	N	O

UNIT VIII

THE REPRODUCTIVE SYSTEM

UNIT TEST

1. Match the terms relating to the reproductive system to the correct definition using number answers.

_____ a. Surgical removal of the breast and axillary lymph nodes

_____ b. Stain used in detection of cancer cells, particularly cells from vagina and cervix

_____ c. Cell produced by the union of an egg cell with a sperm cell

_____ d. Male reproductive cells

_____ e. Cyclic uterine bleeding which normally occurs at approximately four-week intervals in the absence of pregnancy. Controlled by hormones

_____ f. Surgical removal of all or part of the foreskin of the penis

_____ g. Child in uterus at about the third month of pregnancy to birth

_____ h. Secretion of reproductive organs of the male containing sperm cells and secretions from accessory reproductive glands

_____ i. Surgical procedure resulting in sterilization of males. A portion of the ductus deferens on each side is removed, thus preventing sperm cells from reaching the urethra

1. Circumcision
2. Embryo
3. Episiotomy
4. Fertilization
5. Fetus
6. Hermaphrodite
7. Hysterectomy
8. Mastectomy
9. Menstruation
10. Ovulation
11. Papinicolaou stain
12. Reproduction
13. Semen
14. Spermatazoa
15. Vasectomy
16. Zygote

_____ j. An individual with both male and female sex organs

_____ k. Early or developing stage of any organism; in humans, the first weeks of uterine life

_____ l. Process by which offspring are produced

_____ m. Incision of perineum at end of second stage of labor to avoid laceration of perineum and facilitate delivery

_____ n. Surgical removal of the uterus

_____ o. Union of an ovum with a sperm cell to produce a zygote

_____ p. Periodic discharge of ovum from ovary

2. Identify the parts of the male and female reproductive system by completing the following statements:

a. The muscular tube connecting the uterus with the exterior of the body is the ____________ a.

b. A female sex cell is a (an) ____________ b.

c. Male reproductive glands that produce sperm cells and secrete male sex hormones are ____________ c.

d. The terminal portion of the seminal duct formed by the union of the ductus deferens and the excretory duct of the seminal vesicle is the ____________ d.

e. The gland that surrounds the neck of the bladder and urethra, the ducts open into the prostatic portion of the urethra, is the ____________ e.

f. A male reproductive cell is a (an) ____________ f.

g. The external parts of the female reproductive system are called the ______________ g.

h. The pelvic floor, commonly used to mean the area between the vaginal opening and the anus is the ______________ h.

i. The continuation of the epididymis extending to the juncture with the seminal vesicle is the ______________ i.

j. The sac containing the testes is the ______________ j.

k. The organ for containing and nourishing the embryo during pregnancy is the ______________ k.

l. The primary reproductive organs of the female which produce ova are the ______________ l.

m. The glands found above and to each side of the vaginal opening which produce mucus are the ______________ m.

n. The pair of glands found beneath the bulb of the urethra; they produce a mucous secretion, are ______________ n.

o. The tube inside the testis in which sperm cells are collected and stored until they mature and become motile is the ______________ o.

p. The male organ of sexual intercourse is the ______________ p.

q. The fringelike extensions from the edges of the abdominal openings of the fallopian tubes are the ______________ q.

r. The ducts (tube) that transport ova from the body cavity to the uterus are the ______________ r.

s. The tubes extending from the area back of the urinary bladder to the ductus deferens, which secrete a mucoid substance that nourishes sperm cells are the ____________s.

3. Review the sequence of events in the menstrual cycle, by answering the following questions. Use short answers, i.e., phrases, words, or simple sentences:

a. How many days are required to complete the menstrual cycle?

b. When in the menstrual cycle does ovulation occur?

c. What part of the uterus prepares for implantation of the zygote?

d. What becomes of the lining of the uterine wall if fertilization does not occur?

e. Why is blood discharged from the uterus?

f. After 4-7 days, what does the uterine wall prepare for?

g. What does the beginning of menstruation indicate?

h. What is the menopause?

i. What controls the menstrual cycle?

4. The following statements pertain to the discussion of pregnancy and parturition.

If the statement is true, write the word true in the blank space provided, if false write the word false.

________ a. Fertilization normally occurs when the ovum is about one-third of the way down the fallopian tube.

________ b. The zygote becomes implanted six to eight days after fertilization.

________ c. The wall of the fallopian tube functions in the exchange of food, gases and wastes between mother and baby.

________ d. No diseases from the mother may affect the baby.

________ e. Pregnancy in humans normally lasts 180 days.

________ f. Parturition is the process of giving birth to a child, or labor.

________ g. The first stage of labor is characterized by regular uterine contractions, rupture of membranes and a complete dilation of the cervix of the uterus.

________ h. In the second stage of labor the placenta is delivered.

________ i. In the third stage of labor the infant is actually delivered.

________ j. The initiation of labor results from hormonal balance and timing.

5. Complete the following statements using the disorders of pregnancy listed below:

Ectopic pregnancy

Spontaneous abortion

Induced abortion

Criminal abortion

Therapeutic abortion

Miscarriage

Placenta previa

a. The loss of a fetus between 20 and 28 weeks of pregnancy is a (an) ____________

b. An abortion performed by a physician for a variety of reasons is a (an) ____________

c. The abnormal condition in which the placenta is attached to the lower part of the uterus ____________

d. Abortions performed illegally are ____________

e. The condition in which the fertilized ovum is implanted at a site other than the uterine cavity is called a (an) ____________

f. An abortion that occurs without having been induced is a (an) ____________

g. The termination of pregnancy by artificial means is called ____________

6. Identify disorders of the reproductive system by matching the disorders with their identifying phrases using number answers.

_____ a. Inability to reproduce

_____ b. Swelling or enlargement, may occur in any part of the reproductive system

_____ c. Painful menstruation

_____ d. Rupture in abdominal wall in region of wall where testes descended from abdomen into scotum

_____ e. Genitalia of one sex evident, secondary sex characteristics of opposite sex predominate

_____ f. Inflammation of the fallopian tubes

_____ g. Vaginal discharge

1. Amenorrhea
2. Cryptorchidism
3. Dysmenorrhea
4. Gonorrhea
5. Hermaphroditism
6. False hermaphroditism
7. Inguinal hernia
8. Leukorrhea
9. Orchitis
10. Phimosis

_____ h. Absence of menstrual flow

_____ i. Venereal disease caused by a bacterium, characterized by purulent urethral discharge

_____ j. Tightness of foreskin of penis, remedied by circumcision

_____ k. Both male and female sex organs found in the same person

_____ l. Inflammation of the testes due to trauma, mumps, or other infection

_____ m. Infectious venereal disease characterized by lesions which may involve any organ or tissue

_____ n. Any condition resulting in obstruction of the prostate gland with accompanying retention of urine in the bladder

_____ o. Failure of the testes to descend into the scrotum

11. Prostatism
12. Salpingitis
13. Sterility
14. Syphilis
15. Tumor

7. Identify the function of parts of the reproductive system.

8. Recognize words associated with pregnancy and the menstrual cycle in a word scramble puzzle.

9. Select terms which are disorders of the reproductive system and pregnancy in a word-find puzzle.

(NOTE: If activities #7-#9 have not been completed prior to the test, ask the instructor when they should be completed.)

UNIT VIII

THE REPRODUCTIVE SYSTEM

ANSWERS TO UNIT TEST

1. 8 a.
11 b.
16 c.
14 d.
9 e.
1 f.
5 g.
13 h.
15 i.
6 j.
2 k.
12 l.
3 m.
7 n.
4 o.
10 p.

2. a. Vagina
b. Ovum
c. Testes
d. Ejaculatory ducts
e. Prostate
f. Sperm cell
g. Vulva
h. Perineum
i. Ductus deferens
j. Scrotum
k. Uterus
l. Ovaries
m. Bartholin's glands
n. Cowper's glands
o. Epididymis
p. Penis
q. Fimbriae
r. Fallopian tubes
s. Seminal vesicles

3. a. 28 days
b. about the middle of the 28 day cycle
c. uterine wall
d. sloughs off and is expelled

e. the loss of the uterine lining leaves some areas bleeding, thus blood is also discharged

f. begins to prepare again for pregnancy

g. production of ova

h. stage at which the menstural cycle ceases

i. hormones

4. True a.
True b.
False c.
False d.
False e.
True f.
True g.
False h.
False i.
True j.

5. a. miscarriage
b. therapeutic abortion
c. placenta previa
d. criminal abortion
e. ectopic pregnancy
f. spontaneous abortion
g. induced abortion

6. 13 a.
15 b.
3 c.
7 d.
6 e.
12 f.
8 g.
1 h.
4 i.
10 j.
5 k.
9 l.
14 m.
11 n.
2 o.

7. Evaluated to the satisfaction of the instructor.

8. Evaluated to the satisfaction of the instructor.

9. Evaluated to the satisfaction of the instructor.

UNIT IX

ENDOCRINE GLANDS

UNIT OBJECTIVE

After completing this unit, the student will be able to identify terms relative to the endocrine system, locate the endocrine glands, and name and give the function of hormones. The student also will be able to identify disorders of the endocrine system. This knowledge will be evidenced through demonstration and by satisfactorily completing a unit test.

SPECIFIC OBJECTIVES

After completing this unit of instruction, the student will be able to:

1. Match terms with definitions
2. Cite five general functions of hormones
3. Identify the hormones produced by the pituitary gland
4. Locate and discuss the function of the thyroid gland
5. Locate the parathyroid glands and name and give the function of the hormone produced
6. Identify the hormones produced by the adrenal gland
7. Discuss the hormones produced in the pancreas
8. List the hormones produced by the testes and ovaries and give their function
9. Summarize the endocrine activity of the placenta, the pineal gland, and the thymus gland
10. Recognize the names and descriptions of endocrine disorders
11. Locate the endocrine glands in a diagram
12. Complete a chart of the endocrine glands, hormones, and their function
13. Identify endocrine glands in relation to disease

UNIT IX

ENDOCRINE GLANDS

SUGGESTED ACTIVITIES

I. Instructor

  A. Provide objective sheet

  B. Discuss objective sheet

  C. Pass out information sheet

  D. Discuss information sheet

  E. Make and show transparencies

  F. Distribute and discuss assignment sheets

  G. Use torso model or chart of endocrine system to locate endocrine glands

  H. Give test and evaluate results

II. Student

  A. Read objective sheet

  B. Discuss objective sheet

  C. Read material contained in information sheet

  D. Discuss information sheet

  E. Complete assignment sheets

  F. Observe or participate in use of model or chart to locate endocrine glands

  G. Take test

INSTRUCTIONAL MATERIALS

I. Included in this unit

  A. Objectives

  B. Information Sheet

C. Transparency masters

  1. IX-TM-1--The Endocrine Glands

  2. IX-TM-2--Endocrine Glands, Hormones, and Their Functions

D. Assignment Sheets

  1. Assignment Sheet #1--Label Diagram of Endocrine Glands

  2. Assignment Sheet #2--Completion of Chart of Endocrine Glands, Hormones, and Their Functions

  3. Assignment Sheet #3--Identification of Endocrine Glands in Relation to Diseases

E. Answers to Assignment sheets

F. Test

G. Answers to test

II. References: Books

A. Anderson, Paul D. Clinical Anatomy and Physiology for Allied Health Sciences. Philadelphia, Pennsylvania: W.B. Saunders, 1976.

B. Anthony, Catherine Parker and Irene B. Alyn. Structure and Function of the Body. 5th ed. St. Louis, Missouri: C.V. Mosby Company, 1976.

C. Anthony, Catherine Parker and Norma Jane Kolthoff Textbook of Anatomy and Physiology. 9th ed. St. Louis, Missouri: C.V. Mosby Company, 1975.

D. Memmler, Ruth Lundeen and Dena Lin Wood. The Human Body in Health and Disease. 4th ed. Philadelphia, Pennsylvania: J.B. Lippincott Company, 1977.

UNIT IX

ENDOCRINE GLANDS

INFORMATION SHEET

I. Terms and definitions

A. Endocrine gland (ductless gland)--A gland, the secretion of which is liberated directly into the blood stream rather than by means of a duct

B. Exocrine gland--A gland that liberates a secretion by means of a duct

C. Glycogen--Carbohydrate compound stored in animal cells

D. Hormone--The secretion of the ductless glands which regulates the function of other organs

E. Iodine--Chemical element needed for the development and functioning of the thyroid gland

F. Lactation--The secretion of milk

G. Lymphocyte--Type of white blood cell produced in lymph glands

H. Melanin--Pigment which gives color to hair and skin

I. Resorption--To dissolve and assimilate: to absorb again

J. Secondary sex characteristics--Sex characteristics that are not directly concerned with reproduction, as tone of voice, facial hair, and breast development

II. General functions of hormones

A. Regulation of metabolism (energy utilization)

B. Regulation of growth and development

C. Regulation of reproduction

D. Regulation of stress response

E. Regulation of cell permeability

III. Pituitary gland (hypophysis) located at undersurface of the brain, protected by bones of skull, divided into anterior and posterior lobes

A. Hormones produced by anterior pituitary

1. Thyrotropin (TSH)--Controls function of thyroid gland

2. Adrenocorticotropin (ACTH)--Regulates secretion of cortex of adrenal gland

3. Somatotropin or growth promoting hormone (STH)--Regulates skeletal growth. Deficiency may result in dwarfism; excess in young may result in giantism; in adults, in acromegaly.

4. Follicle-stimulating hormone or gonadotropic hormone (FSH)--Controls development of reproductive systems in males and females.

5. Lactogenic hormone (LTH)--Promotes production of milk in mammary glands and general development of breasts during pregnancy.

6. Interstitial cell-stimulating hormone (ICSH)--Regulates the secretion of male sex hormone testosterone in the testes. Interstitial cell stimulating hormone and testosterone together control the development of masculine secondary sex characteristics

7. Luteinizing hormone (LH)--Stimulates ovulation and formation of corpus luteum at site of ruptured ovarian follicle

8. Melanocyte stimulating hormone (MSH)--Regulates deposition of melanin in skin, providing pigmentation

B. Hormones produced by posterior pituitary

1. Oxytocin--Promotes generalized contraction of smooth muscles, particularly the uterus in late pregnancy.

2. Vasopresin--

a. Regulates water retention by kidneys. Deficiency may result in diabetes insipidus

b. Can produce mild increase in blood pressure as a vasoconstrictor

IV. Thyroid gland--located just below larynx in neck, consists of right and left lobes connected by an isthmus that lies on the upper trachea

A. Principal hormone is thyroxine, which regulates metabolism; thus the production of energy in cells

B. Thyroid requires iodine in diet in order to produce thyroxine

C. Hypothyroidism--Deficiency of thyroxine

1. At birth, results in cretinism

2. In adults, results in myxedema

D. Hyperthyroidism--Excess of thyroxine

1. Grave's disease (exophthalmic goiter)

2. Simple goiter

E. Tests for thyroid function

1. Basal metabolism test (BMR)--determination of amount of oxygen a person uses under basal conditions

2. Protein bound iodine test (PBI)--determination of amount of iodine in blood

3. Use of radio-active iodine to determine thyroid function

V. Parathyroid glands--Two pairs, lie on lobes of thyroid gland

A. Secrete parathormone

B. Regulate calcium metabolism

1. Deficiency of parathormone results in muscle spasms and convulsions called tetany

2. Excess of parathormone causes calcium to leave bones, causing them to become soft and easily bent

VI. Adrenal glands--One pair, located above each kidney

A. Cortex--Outer part of adrenal gland

    1. Hormones secreted
        a. Aldosterone--Regulates control of resorption of sodium in kidney tubules and excretion of potassium; e.g. electolyte regulation
        b. Cortisol (cortisone)--Maintains carbohydrate reserve of body by changing amino acids to sugar instead of protein, when needed by body
        c. Adrenosterone--Governs secondary sex characteristics
    2. Production of these hormones from the adrenal cortex is stimulated by ACTH from the pituitary
    3. Deficiency of secretion of cortex results in Addision's disease
    4. Oversecretion results in Cushing's disease

  B. Medulla--Inner area of the adrenal glands
    1. Secretes hormones epinephrine (adrenalin) and norepinephrine which are closely related
    2. Functions of hormones
        a. Elevate blood pressure by accelerating heart rate and by vasoconstriction
        b. Promote breakdown of glycogen to glucose, thus increasing blood sugar concentration
        c. Cause dilation of bronchioles through relaxation of smooth muscles

VII. Pancreas--Lies close to posterior wall of abdomen behind the stomach

  A. Exocrine function -- to secrete digestive enzymes

  B. Endocrine function--Carried on by areas of specialized tissue in pancreas called "Islets of Langerhans"
    1. Hormones secreted are insulin and glucagon
    2. Functions of insulin

        a. Regulates rate of glucose metabolism

        b. Regulates blood glucose concentration

    3. Deficiency of insulin results in diabetes mellitus

    4. Increased insulin production (hyperinsulinism) may result in insulin shock

    5. Glucagon--Controls rate at which liver changes glycogen to glucose

VIII. Sex glands

A. Male (testes)--Produce hormone testosterone

1. Regulates development of male secondary characteristics

2. Influences development, maintenance, and function of reproductive organs

B. Female (ovaries)--Produce the hormones estrogen and progesterone

1. Estrogen regulates the development and maintenance of the female reproductive system, and the development of female secondary sex characteristics

2. Progesterone assists in normal development in pregnancy

IX. Other hormone-producing organs

A. Placenta

1. Produces hormones that cause changes in the uterine lining, and prepares breast for lactation

2. Pregnancy tests are based on presence of placental hormones

B. Pineal gland--Located in cranial cavity at about the middle of the brain

1. Function in humans controversial

2. The hormone, melatonin, is produced in some animals

C. Thymus gland--Located in chest in front of the aorta and behind the sternum

1. Most active during prenatal life and in infancy

2. Produces hormones that stimulate the production of small lymphocytes

3. Secretes thymosin (thymic hormone) which promotes growth of lymph tissue

X. Disorders of the endocrine glands

A. Acromegaly--Disease of adults that results from hyperactivity of anterior pituitary; characterized by widening of the bones of the hands, face, and feet

B. Dwarfism--Disease that results from a deficiency of the somatotropic hormone produced by the anterior pituitary. The patient is abnormally short or undersized.

C. Giantism--Disease that results from hyperactivity of the anterior pituitary in childhood, causing abnormal tallness

D. Diabetes insipidus--Disease in which a deficiency of vasopresin of the posterior pituitary prevents reabsorption of water by renal tubules. This leads to the excretion of large volumes of urine.

E. Diabetes mellitus--Disease that results from a lack of insulin. Glucose is not utilized by the body but is excreted in the urine.

F. Hyperinsulinism--Condition in which there is an excess of insulin in the blood. This may be due to the overactivity of the Islets of Langerhans or the treatment of diabetes mellitus if more insulin is given than needed.

G. Cretinism--Condition in which there is a serious lack of thyroid activity from infancy. The patient becomes dwarfed and mentally deficient.

H. Myxedema--Hypothyroidism in adults. The patient is mentally and physically sluggish, skin and hair are dry, tissues of face swell.

I. Goiter--Enlargement of the thryoid gland

   1. Simple goiter--Goiter which results from a deficiency of iodine in the diet. The thyroid gland enlarges in an effort to compensate for lack of iodine.

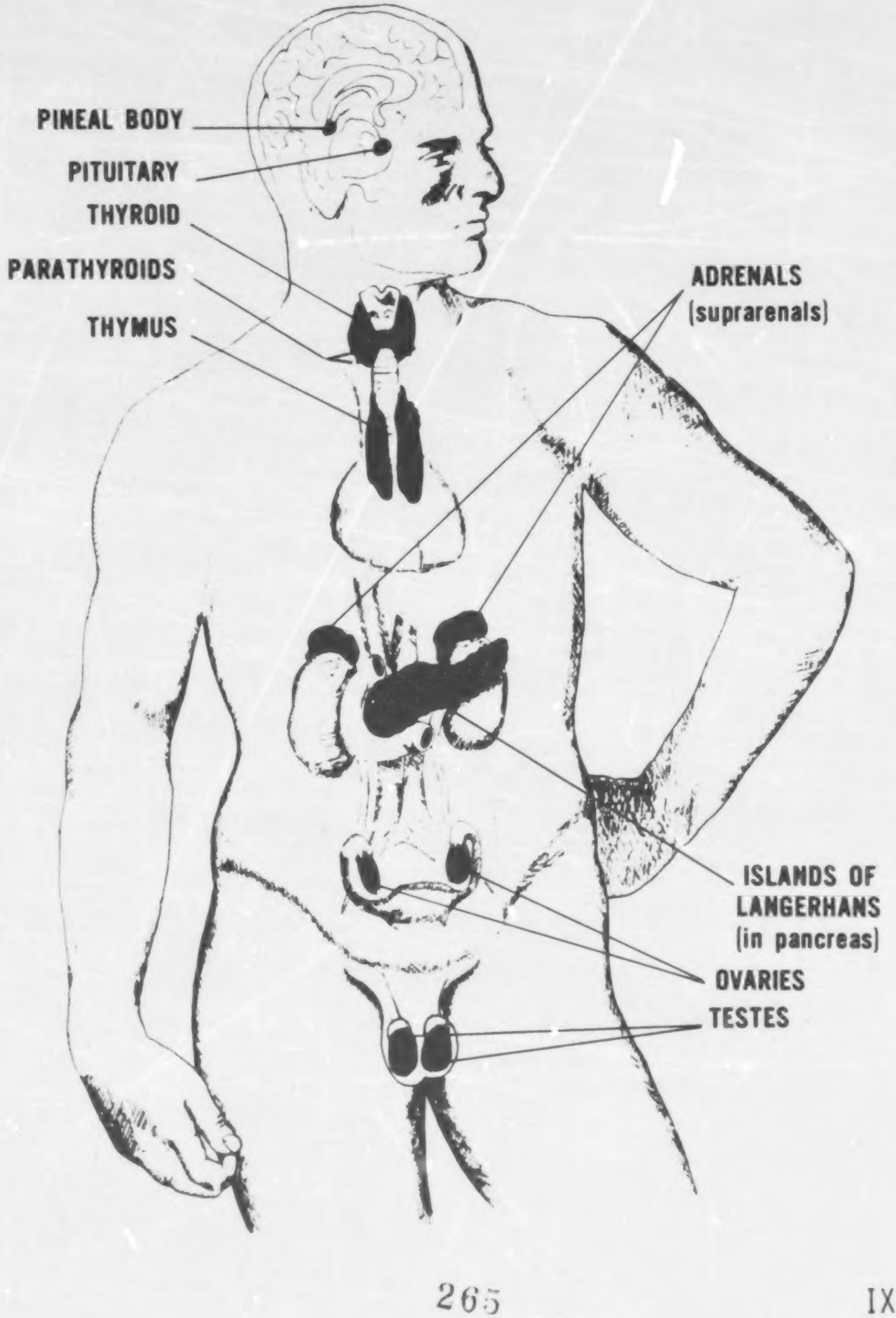
   2. Exophthalmic goiter (Graves' disease)--Disease characterized by presence of a goiter, bulging of the eyes, strained appearance of face, intense nervousness, weight loss, rapid pulse, sweating and tremor, and a rapid metabolic rate.

J. Addison's disease--Hypofunction of adrenal cortex. Symptoms are hypotension, general weakness, loss of appitite, "bronzing" of the skin, and electrolyte imbalance.

K. Cushing's disease--Oversecretion of the adrenal cortex. Symptoms are tissue swelling, muscle and bone weakness, and masculinizing effects on women.

ENDOCRINE GLANDS

(Both male and female gonads are shown)


PINEAL BODY
PITUITARY
THYROID
PARATHYROIDS
THYMUS
ADRENALS
(suprarenals)
ISLANDS OF
LANGERHANS
(in pancreas)
OVARIES
TESTES

ENDOCRINE GLANDS, HORMONES, AND THEIR FUNCTIONS

Gland	Hormone	Primary Function
Pituitary,		
Anterior Lobe	Thyrotropin (THS)	Controls function of thyroid gland
	Adenocorticotropin (ACTH)	Regulates secretion of cortex of adrenal gland
	Somatotropin (STH)	Regulates skeletal growth
	Follicle-stimulating (FSH)	Controls development of reproductive systems
	Lactogenic hormone (LTH)	Promotes production of milk in mammary glands and general development
	Interstitial cell stimulating hormone (ICSH)	Regulates control and secretion of male sex hormone testosterone in testes. ICSH and testosterone together control development of male secondary sex characteristics
	Luteinizing hormone (LH)	Stimulates ovulation and formation of corpus luteum at site of ruptured ovarian follicle
	Melanocyte-stimulating hormone (MSH)	Regulates deposition of melanin in skin, providing pigmentation
Pituitary--		
Posterior lobe	Oxytocin	Promotes generalized contraction of smooth muscles, particularly the uterus in late pregnancy

ENDOCRINE GLANDS, HORMONES, AND THEIR FUNCTIONS (con't)

Gland	Hormone	Primary Function
Pituitary--		
Anterior lobe	Vasopresin	Regulates water retention by kidney. Can produce mild increase in blood pressure as a vasoconstrictor
Thyroid	Thyroxine	Regulates metabolism
Parathyroid	Parathormone	Regulates calcium metabolism
Adrenal-- cortex	Aldosterone	Regulates electrolyte balance
	Cortisone (cortisol)	Maintains carbohydrate reserve
	Adrenosterone (Androgen)	Regulates male secondary sex characteristics
Adrenal--		
Medulla	Epinephrine (adrenalin)	Accelerates heart rate and causes vasoconstriction, thus raises blood pressure
Pancreas	Insulin	Regulates rate of glucose metabolism. Regulates concentration of glucose in blood
	Glucagon	Maintains glucose concentration in blood by causing liver to change glycogen to glucose

IX-TM-2 CON'T

ENDOCRINE GLANDS, HORMONES, AND THEIR FUNCTIONS (con't)

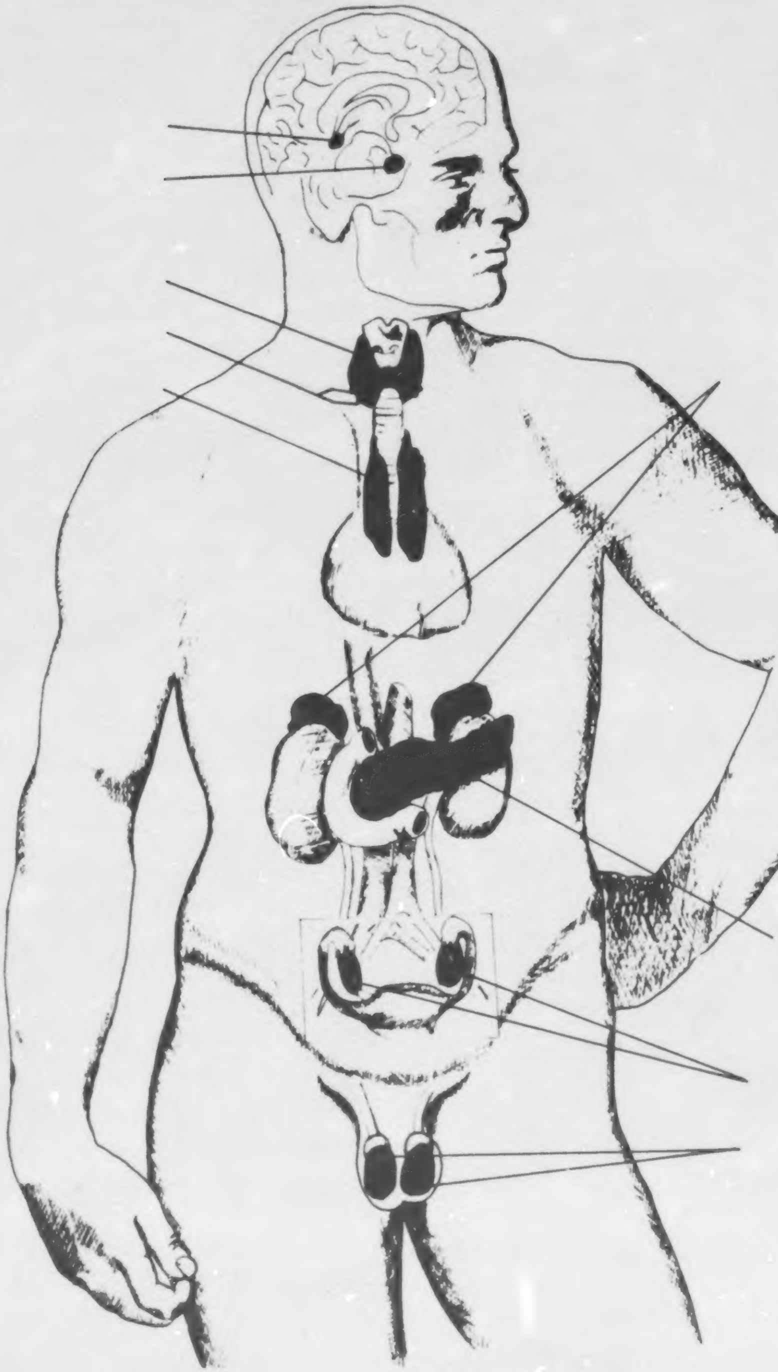
Gland	Hormone	Primary Function
Testes	Testosterone	Regulates development of male secondary sex characteristics. Influences development, maintenance, and function of male reproductive organs
Ovaries	Estrogen	Regulates development and maintenance of female reproductive system. Regulates development of secondary sex characteristics
	Progesterone	Normal development in pregnancy

UNIT IX

ENDOCRINE GLANDS

ASSIGNMENT SHEET #1--LABEL DIAGRAM OF ENDOCRINE GLANDS

(Both male and female gonads are shown)



UNIT IX

ENDOCRINE GLANDS

ASSIGNMENT SHEET #2--COMPLETION OF CHART OF ENDOCRINE GLANDS, HORMONES, AND THEIR FUNCTION

Directions: Using the chart of endocrine glands, hormones, and their function, fill in the numbered blanks with the appropriate word or phrase.

ENDOCRINE GLANDS, HORMONES AND THEIR FUNCTIONS

GLAND	HORMONE	PRIMARY FUNCTION
Pituitary--		
Anterior lobe	Thyrotropin (THS)	(1) ____________________
	Adenocorticotropin (ACTH)	Regulates secretion of cortex of adrenal gland
	(2) ________________	Regulates skeletal growth
	Follicle-stimulating (FSH)	(3) ____________________
	(4) ________________	Promotes production of milk in mammary glands and general development
	Interstitial cell stimulating hormone (ICSH)	Regulates control and secretion of male sex hormone testosterone in testes. ICSH and testosterone together control development of male secondary sex characteristics
	(5) ________________	Stimulates ovulation and formation of corpus luteum at site of ruptured ovarian follicle
	Melanocyte-stimulating hormone (MSH)	(6) ____________________

Pituitary--Posterior lobe	Oxytocin	(7) ____________________
	(8) ______________	Regulates water retention by kidney. Can produce mild increase in blood pressure as a vasoconstrictor
Thyroid	(9) ______________	Regulates metabolism
(10) ____________	Parathormone	Regulates calcium metabolism
Adrenal--		
Cortex	(11) ______________	Regulates electrolyte balance
	Cortisone (cortisol)	Maintains carbohydrate reserve
	Adrenosterone (androgen)	Regulates male secondary sex characteristics
Adrenal--		
Medulla	(12) ______________	Accelerates heart rate and causes vasoconstriction, thus raises blood pressure
(13) ____________	Insulin	Regulates rate of glucose metabolism Regulates concentration of glucose in blood
	Glucagon	Maintains glucose concentration in blood by causing liver to change glycogen to glucose
Testes	(14) ______________	Regulates development of male secondary sex characteristics. Influences development, maintenance and function of male reproductive organs

Ovaries	(15) ____________	Regulates development and maintenance of female reproductive system Regulates development of female secondary sex characteristics
	Progesterone	(16) ________________________

UNIT IX

ENDOCRINE GLANDS

ASSIGNMENT SHEET #3--IDENTIFICATION OF ENDOCRINE GLANDS IN RELATION TO DISEASES

Directions: Place in the blank space at the right the name of the endocrine gland which is related to the diseases listed. (Give the part of the gland if indicated.)

A. Acromegaly ____________________ A.

B. Addison's disease ____________________ B.

C. Cretinism ____________________ C.

D. Cushing's disease ____________________ D.

E. Diabetes insipidis ____________________ E.

F. Diabetes mellitus ____________________ F.

G. Dwarfism ____________________ G.

H. Exophthalmic goiter ____________________ H.

I. Gigantism ____________________ I.

J. Hyperinsulinism ____________________ J.

K. Myxedema ____________________ K.

UNIT IX

ENDOCRINE GLANDS

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1--See labeled transparency IX-TM-1

Assignment Sheet #2--Endocrine Glands, Hormones and Their Functions

1. Controls function of thyroid gland
2. Somatotropin (TH)
3. Controls development of reproductive systems
4. Lactogenic hormone (LTH)
5. Luteinizing hormone (LH)
6. Regulates deposition of melanin in skin, providing pigmentation
7. Promotes generalized contraction of smooth muscles, particularly the uterus in late pregnancy
8. Vasopresin
9. Thyroxine
10. Parathyroid
11. Aldosterone
12. Epinephrine (adrenalin)
13. Pancreas (Islets of Langerhans)
14. Testosterone
15. Estrogen
16. Normal development in pregnancy

Assignment Sheet #3--Identification of Endocrine Glands in Relation to Diseases

A. Anterior pituitary

B. Adrenal cortex

C. Thyroid

D. Adrenal cortex

E. Posterior pituitary

F. Pancreas (or Islets of Langerhans)

G. Anterior pituitary

H. Thyroid

I. Anterior pituitary

J. Pancreas (or Islets of Langerhans)

K. Thyroid

UNIT IX

ENDOCRINE GLANDS

UNIT TEST

1. Match the terms on the right with their correct definitions.

_____a. Carbohydrate compound stored in animal cells

_____b. Chemical element needed for the development and functioning of the thyroid gland

_____c. A gland, the secretion of which is liberated directly into the blood stream, rather than by means of a duct

_____d. Sex characteristics that are not directly concerned with reproduction, as tone of voice, facial hair, and breast development

_____e. Pigment which gives color to hair and skin

_____f. To dissolve and assimilate, to absorb again

_____g. The secretion of milk

_____h. A gland that liberates a secretion by means of a duct

_____i. Type of white blood cell produced in lymph glands

_____j. The secretion of ductless glands, which regulate the function of other organs

1. endocrine gland
2. exocrine gland
3. glycogen
4. hormone
5. iodine
6. lactation
7. lymphocyte
8. melanin
9. resorption
10. secondary sex characteristic

2. Cite five general functions of hormones.

A.

B.

C.

D.

E.

3. Identify the hormones produced by the pituitary gland by completing the following statements.

   A. Hormones produced by the anterior pituitary:

      1. The hormone that controls the function of the thyroid gland is ________________
      2. The hormone that regulates the secretion of the cortex of the adrenal gland is ________________
      3. The hormone that regulates skeletal growth is ________________
      4. The hormone that controls the development of reproduction systems in males and females is ________________
      5. The hormone that promotes the production of milk in mammary glands is ________________
      6. The hormone that regulates the secretion of testosterone and, with testosterone, controls the development of male secondary sex characteristics is ________________
      7. The hormone that stimulates ovulation and the formation of corpus luteum at the site of the ruptured ovarian follicle is ________________

8. The hormone that regulates the deposition of melanin in the skin is _______________

B. Hormones produced by the posterior pituitary:

1. The hormone that promotes generalized contractions of smooth muscles, particularly of the uterus in late pregnancy is _______________

2. The hormone that regulates water retention by kidneys and also acts as a vasoconstrictor is _______________

4. A. Locate and discuss the function of the thyroid gland.

B. List three tests for thyroid function

1.

2.

3.

5. Locate the parathyroid glands, name the hormone produced and give its function

6. Identify the hormones produced by the adrenal gland by answering the following questions.

   A. Cortex

      1. Which hormone regulates electrolyte balance? ______________

      2. Which hormone maintains the carbohydrate reserve of the body by changing amino acids to sugar instead of protein? ______________

      3. Which hormone governs the secondary sex characteristics? ______________

   B. Medulla

      What are three general functions of epinephrine and norepinephrine?

      1.

      2.

      3.

7. Discuss the functions of insulin.

8. List the hormones produced by the testes and ovaries and give their function

9. Summarize the endocrine activity of the placenta, the pineal gland, and the thymus gland.

10. Choose from the following list, the endocrine disorder described in the lettered phrases. Place your answer in the blank space at the end of each phrase.

acromegaly

Addison's disease

cretinism

Cushing's disease

diabetes insipidus

diabetes mellitus

dwarfism

exophthalmic goiter

giantism

hyperinsulinism

myxedema

a. An oversecretion of the adrenal cortex. Symptoms are tissue swelling, muscle and bone weakness, and masculinizing effects in women. ______________

b. Hypofunction of the adrenal cortex. Symptoms are hypotension, general weakness, loss of appetite, "bronzing" of the skin and electrolyte imbalance. ______________

c. Disease characterized by presence of a goiter. Bulging of the eyes, strained appearance of face, intense nervousness, weight loss, rapid pulse, sweating, and tremor. ______________

d. Hypothyroidism in adults. The patient is mentally and physically sluggish, skin and hair are dry, tissues of face swell. ______________

e. Condition in which there is an excess of insulin in the blood. This may be due to the overactivity of the Islets of Langerhans, or to the treatment of diabetes mellitus if more insulin is given than needed. ______________

f. Condition in which there is a serious lack of thyroid activity from infancy. The patient becomes dwarfed and mentally deficient. ________________

g. Disease that results from a lack of insulin. Glucose is not utilized by the body, but is excreted in the urine. ________________

h. Disease in which a deficiency of vasopresin of the posterior pituitary prevents reabsorption of water by the renal tubules. This leads to the excretion of large volumes of urine. ________________

i. Disease that results from hyperactivity of the anterior pituitary in childhood causing abnormal tallness. ________________

j. Disease that results from a deficiency of the somatotropic hormone produced by the anterior pituitary. The patient is abnormally short or undersized. ________________

k. Disease of adults that results from hyperactivity of the anterior pituitary, characterized by widening of the bones of the hands, face, and feet. ________________

11. Locate the endocrine glands in a diagram.

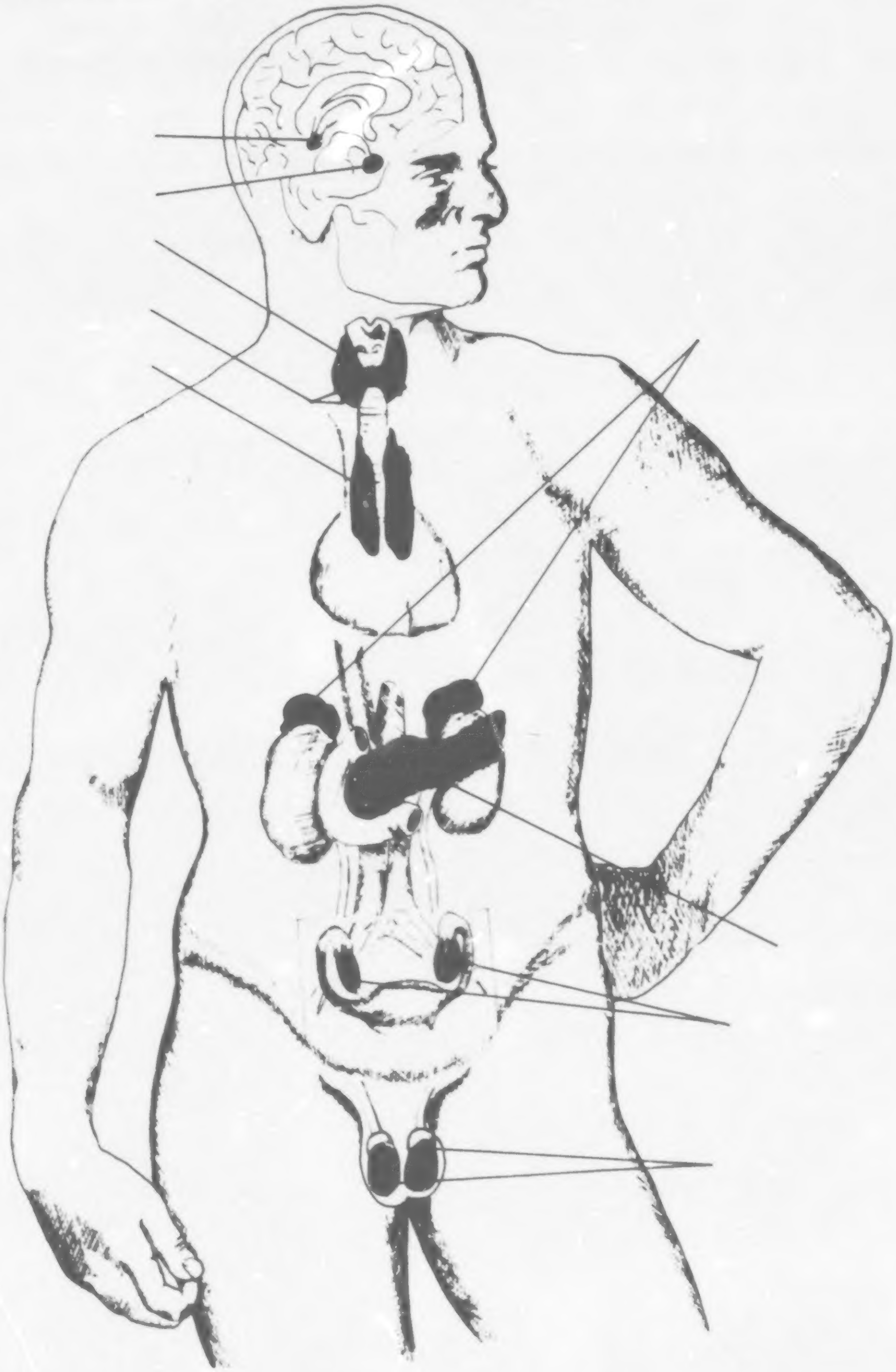
12. Complete a chart of the endocrine glands, hormones and their functions.

13. Identify endocrine glands in relation to disease.

(NOTE: If activities #11 - #13 have not been completed prior to the test, ask the instructor when they should be completed.)

ENDOCRINE GLANDS

(Both male and female gonads are shown)



UNIT IX

ENDOCRINE GLANDS

ANSWERS TO UNIT TEST

1. 3 a.

   5 b.

   1 c.

   10 d.

   8 e.

   9 f.

   6 g.

   2 h.

   7 i.

   4 j.

2. A. Regulation of metabolism

   B. Regulation of growth and development

   C. Regulation of reproduction

   D. Regulation of stress response

   E. Regulation of cell permeability

3. A. Anterior pituitary

      1. thyrotropin
      2. adrenocorticotropin
      3. somatotropin
      4. follicle-stimulating (gonadotropic)
      5. lactogenic hormone
      6. interstitial cell stimulating
      7. luteinizing hormone
      8. melanocyte stimulating hormone

   B. 1. oxytocin

      2. vasopressin

4. A. The thryoid gland is located just below the larynx, in the neck. Its function is to produce the hormone thyroxine, which regulates metabolism.

B. 1. Basal metabolism test- which determines the amount of oxygen a person uses under basal conditions.

2. Protein bound iodine test (PBI), which determines the amount of iodine in the blood.

3. The use of radio-active iodine to determine thyroid function.

5. The parathyroid glands are located on the lobes of the thyroid gland.

The hormone produced is parathormone. Parathormone regulates calcium metabolism.

6. A. Cortex
1. aldosterone

2. cortisol (cortisone)

3. adrenosterone

B. 1. Elevates blood pressure by accelerating heart rate and by vasoconstriction.

2. Promotes breakdown of glycogen to glucose, thus increasing blood sugar concentration.

3. Causes dilation of bronchioles through relaxation of smooth muscles

7. The Islets of Langerhans of the pancreas secrete the hormones insulin and glucagen. Insulin regulates the rate of glucose metabolism and the concentration of glucose in the blood. A deficiency of insulin results in diabetes mellitus, increased production of insulin may cause insulin shock. Glucagon controls the rate at which the liver changes glycogen to glucose.

8. Testes:

A. Testosterone--

1. Regulates the development of male secondary sex characteristics

2. Influences the development, maintenance and function of the reproductive organs.

B. Ovaries:

1. Estrogen--

a. Regulates the development and maintenance of the female reproductive system.

b. Regulates the development of female secondary sex characteristics.

2. Progesterone--

Assists in normal development in pregnancy

9. The placenta produces hormones that cause changes in the uterine lining and prepare breasts for lactation.

The pineal gland produces melatonin in some animals. Its function in humans is controversial.

The thymus gland produces hormones that stimulate the production of small lymphocytes. It also produces thymosin which promotes the growth of lymph tissue.

10. a. Cushing's disease

b. Addison's disease

c. exophthalmic goiter

d. myxedema

e. hyperinsulinism

f. cretinism

g. diabetes mellitus

h. diabetes insipidus

i. gigantism

j. dwarfism

k. acromegaly

11. Evaluated to the satisfaction of the instructor.

12. Evaluated to the satisfaction of the instructor.

13. Evaluated to the satisfaction of the instructor.